THE SEQUELS OF DISEASE

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SEQUELS OF DISEASE

BEING THE LUMLEIAN LECTURES DELIVERED IN THE ROYAL COLLEGE OF PHYSICIANS, 1896

TOGETHER WITH OBSERVATIONS ON PROGNOSIS IN DISEASE

BY

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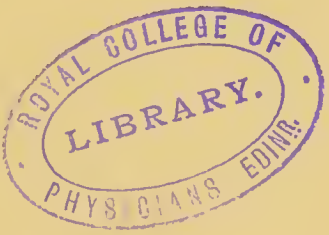

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TO THE MEMORY

OF

SIR JOHN RUSSELL REYNOLDS, BARONET

M.D., LL.D., F.R.S.

PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS

1894–1896

BY WHOSE APPOINTMENT THESE LECTURES WERE DELIVERED

AND WHOSE FRIENDSHIP IT WAS MY PRIVILEGE

TO ENJOY FROM THE EARLIEST DAYS OF

MY PROFESSIONAL LIFE

I inscribe this Volume

PREFACE

I AM encouraged to submit these Lectures to the Profession in the hope that there may be found in them some substantial aid towards a more complete study of the Sequels of Disease.

I was led to take up this subject by the remark* of Doctor William Baly to Sir James Paget, whose record of it had often come to my remembrance, and stirred in me the ambition to try and follow up its suggestion.

It appeared to me little less than a duty for a Teacher in Baly's own School to make at least a beginning in carrying out his idea.

Sir James Paget has kindly encouraged me in these efforts, and all who study the subject must count him amongst those who have largely contributed to our present knowledge of the diseases of convalescence.

I cannot but believe that these Lectures were tedious to listen to, and I suppose that they will prove no less uninteresting to read consecutively.

* See p. 6.

The variety of the subjects treated, and the multiplicity of facts set out in relation to them, appear to me to justify this opinion. Such Lectures are mostly available for purposes of specific reference, and to aid the reader in this respect I have taken pains to make as copious and complete an Index to them as possible.

I have ventured to publish together with these Lectures some observations on the subject of Prognosis of Disease. Many of these formed part of the Address in Medicine, which I was appointed to deliver in July last before the Annual Meeting of the British Medical Association held at Carlisle.

Of this Essay, as of the Lectures which precede it, I have to state that it constitutes but an attempt to put into concrete form some of our present knowledge of the subject.

A kindly critic of this Address* has remarked that I appear to raise the empirical rules I have laid down relating to prognostics, to something like laws of Nature in the exact sense, and to forget that "such rules, being mere maxims, if they are not to become a mischievous bondage, must be continually compared with Nature, and

* *Brit. Med. Journal*, Aug. 1, 1896, p. 280.

recast from time to time in the light of new discoveries, new measurements, and even of new empirical rules."

As no such intention was in my mind, I gladly accentuate the force of this criticism, should I appear to have laid myself open to it, and I readily admit, with the writer, that such provisional rules are not to be regarded as "natural laws," but "as a pale forecast of them?" It may fairly be conceived that within the next quarter of a century the Art of Medicine will need a searching revision in respect of all matters relating to prognostics. In this Essay I have been mainly concerned to formulate our present knowledge, and thus to place a stepping-stone from which in due time a further, and probably a more bold, advance may be made into this difficult department of Medicine.

The same critic demurs to the use of *πρόνοια* as an equivalent of *πρόγνωσις*. I am willing to believe that the former word may strictly signify a natural or intuitive gift of prescience, while the latter would appear to entail a laborious cultivation of that quality. The former word was, however, employed by Hippocrates himself, and by later authorities, as an equivalent of *πρόγνωσις*.

I may add that I have made use in this Essay

of the "Prognostics" as well as of the "Prorrhetics" and the "Aphorisms" of Hippocrates. The latter work Professor Gairdner tells me he has always considered to be a contribution to the diagnosis rather than the prognosis of disease.

I have appended a complete index to the numerous facts touched upon in this part of the volume which may serve for purposes of ready reference.

11 Grafton Street, Piccadilly
November, 1896

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LECTURE I

Mr. President and Gentlemen,

Three hundred and fifteen years ago, Dr. Richard Caldwell, a former President of this College, and Lord Lumley obtained leave of Queen Elizabeth to found a Surgical Lectureship in this College.[1] They endowed it in perpetuity

[1] Dr. Church, in his Harveian Oration last year, signalised Dr. Caldwell and Lord Lumley as amongst the foremost of the benefactors of this College. He endeavoured, without success, to discover the nature of the connection between them. He noted that Lord Lumley succeeded his step-father, Lord Arundel, as High Steward of the University of Oxford in 1558. He was the seventh Baron, and succeeded his grandfather, George Lumley. His own father suffered death for high treason in the ninth year of Henry VIII. He was made a Knight of the Bath. He was a fellow-commoner of Queen's College, Cambridge; died in 1609, and was buried in the chancel of the church at Cheam (*vide* Appendix, p. 55 of Dr. Church's Oration). Holinshed speaks of Caldwell as "the English Hippocrates and Galen." He was a Fellow of Brasenose, and Senior Student of Christ Church, Oxford, and President of this College in 1570. Caius succeeded him for a third term of office in 1571.

with the sum of forty pounds *per annum*, one-half of which was charged on Lord Lumley's estates in Sussex, the other on Dr. Caldwell's properties in Derbyshire. The Lumleian Lecturers were at first appointed for life. One who so held the office was the illustrious Harvey, who was instituted to it two hundred and eighty years ago, and who, with some intermissions, was Lumleian Lecturer for forty years. He resigned the position in 1656, when, owing to failing health, he formally took his leave of the College, and handed over the title-deeds of his patrimonial estate at Burmarsh for its benefit. It was in his capacity of Lumleian Lecturer that he gradually promulgated and demonstrated his original researches upon the circulation of the blood.

It is of interest to find that our College is indebted to Harvey, as Dr. Munk tells us, for enforcing by expensive legal proceedings the due payment of the Lecturer's salary from the heirs of Lord Lumley. In 1640 he sought permission from the College to sue for the unpaid rent-charges, which was granted. Harvey's absence from London with the King, and the political disturbances of the period, probably prevented his carrying out this object. Harvey had been Treasurer of the College from 1628–1629, and

knew all about its finances (such as they were in those days). He returned to the charge, however, in 1647, having again sought permission to sue for what was due. It is sad to learn that after expending at least five hundred pounds in various law-suits, lasting over ten years, to secure what was right, the matter was not effectually settled till some time after his death, and only then at the expense of his friend and executor, Sir Charles Scarburgh, to whom he transferred this Lectureship, and also bequeathed his velvet gown and "silver instruments of surgerie."

The College will, I feel sure, gladly learn that as the Treasurer of to-day, I find no difficulty in securing punctual payments of the several small rent-charges due under the Lumley Trust to its chest.

A Lumleian Lecturer may be pardoned if he seeks in ever so small a way to commemorate some of his predecessors in the office, but I will intrude no further on your patience than by reminding you merely of the names of such men as Peter Mere Latham, Thomas Watson, Richard Bright, Thomas Mayo, James Copland, Alexander Tweedie, and George Burrows, not to mention those of men now happily still with us, who have stood in this place, and by their prelections shed light on many difficult problems in physic.

Although it was clearly the intention of the founders of these Lectures that some surgical subject should be discussed by the Lecturer, we have evidence that very shortly after their institution there was but a scanty attendance at the "Chirurgical Lectures."[1] Harvey's discourses, doubtless, proved more attractive some thirty years afterwards, and were mainly anatomical and physiological. Early in the eighteenth century the lectures appear to have become strictly medical, or on subjects coming distinctly within the province of the physician. The reason for this is, I think, quite obvious. Cheselden and Percivall Pott were at work at this time, and John Hunter, the pupil of the latter, was soon to make his name famous. Our sister College was about to get a new charter, and foster the labours of Hunter and his brilliant pupils. The physicians were no longer to teach anatomy to surgeons Medicine and surgery were henceforth, as Abernethy expressed it, "one and indivisible." If that was recognised as a fact late in the eighteenth century, what shall we say of it now in the last years of the nineteenth? I feel sure that

[1] It is not a little curious to know that in the original deed constituting these Lectures, it is declared that the Fellows of the College are to be fined for non-attendance on them.

nowhere will it be more certainly affirmed than in this place, and approved by such an auditory as is now present, that the triumphs of modern surgery command the admiration and the warmest appreciation of the best clinical physicians. The advances of surgery have in the best interests of our patients compelled our attention to them, and it may be fairly affirmed that this has been done in no grudging spirit, for we work happily and harmoniously together with surgeons for the welfare of suffering humanity.

The natural course of events in the progress and evolution of the sciences on which our art depends has therefore led your Lumleian Lecturers to select for many years past subjects for their discourses which come more especially under the cognizance of the physician. Four years ago my predecessor[1] in this course of lectures took for his subject the Ætiology of Disease, considered from a modern standpoint. It appears now desirable to review our knowledge as to the sequels of diseases from a similar position. I could wish it were in my power to bring before you an exposition of these chapters of pathology with something of the erudition and lucidity which characterised the lecturer of 1892.

[1] Dr. Pye-Smith.

I propose, then, in this course of lectures to discuss as fully as I can the subject of the Sequels of Disease. Our knowledge of this is far from anything like completeness; indeed, it may be said to be very small and most inadequate, yet it is a very large subject, and it has never, so far as I am aware, been made one of systematic study. It was a saying of one of our most distinguished Fellows, the late Dr. William Baly, whose early death was the gravest loss to my own Hospital, to this College, and to the whole Profession in England—a saying treasured up in the writings of his colleague, Sir James Paget—that, in his opinion, one of the most useful books that might be written would be one on the diseases of convalescence. That opinion was uttered some five-and-thirty years ago, but in the meantime no such book has gone through the press.

It may, however, now be truly affirmed that within this period large additions have been made to our knowledge of the sequels of disease. We are in a better position to review the whole subject, better equipped than were those of a generation back to speak with certainty on some of the problems involved, and thus able to traverse the opinions then put forth, and to test them by the light of modern researches which have been,

and continue to be, so remarkable, so fruitful, and so noteworthy.

The field for observation and exact determination in the direction I now set out upon is indeed immense, so large that the experiences of no one amongst us are, or ever can be, adequate for the purpose in view, and we may therefore ask at the outset, "Who is sufficient for these things?"

I can only hope, then, to try and map out the large field before me somewhat in the fashion of an explorer in a new territory. Many gaps and many tracts will be left blank on the chart. Others will come after, and fill in these spaces in the dark country with better purpose and more lucid delineation.

But it is indeed time that something were provisionally attempted, and definitely laid down.

The first difficulty which besets the inquirer into this subject is to determine and define what constitutes a true sequel in the case of any disease. This difficulty grows greater as modern research throws more light upon ætiology and the intimate nature of morbid processes. What the physicians of half a century ago deemed to be sequels of disease must now be regarded by us, in not a few instances, as but later evolutional manifestations of the primary and original *quidquid*

irritans. Such consequences may occur early or very late, and yet may be certainly referred to the noxious elements which originally broke in, and disturbed the health of the individual. In such instances, I take it that we must regard the particular consequence as a genuine sequel, although we do not regard it from the patient's point of view as a new malady.

We shall find that many of the disorders of convalescence fall into the category I have just indicated.

The early physicians recognised the occurrence of some sequels of diseases, though but little is to be found bearing on the subject in their writings. It is certain, for instance, that Hippocrates was familiar with orchitis as an early and a late consequence of parotitis, since he described the condition at some length in the *Epidemics*. Aretæus noted that gout passed into dropsy, and sometimes into asthma.[1]

Seventy years ago, the subject attracted much attention from Graves, who in his chapter on Fever described several sequels, and especially the occurrence of white leg, or venous thrombosis.[2]

[1] περὶ αἰτίων και σημείων χρόνιων πάθων. βιβλ. Β.
περὶ Αρθρίτιδος και Ισχίαδος.

[2] *Clin. Med.*, reprint from 2nd edit. p. 195, 1864.

About the same time, Dr. Caleb Hillier Parry, of Bath, a Licentiate of this College, was near to describing sequels of diseases in his interesting volumes on the *Elements of Pathology and Therapeutics*, especially in his chapter on the Relation of Diseases by Conversion, wherein he embodies a series of careful observations made upon patients many of whose symptoms were then really inscrutable to him, although they were believed to be due to increased determination of blood, his universal doctrine, but of which some admit now of very clear interpretation. Thus, we meet with accounts of "cases of pleurisy which gave way to immediate and fatal diseases of the head, of which one case was proved by the dissection to have arisen from inflammation and albuminous effusion above the pia mater." Here we have, without doubt, a case of tuberculous pleurisy, to which tuberculous meningitis was a sequel. In another case, he tells of hæmorrhage from the kidneys immediately succeeding the desquamation of measles. We can hardly doubt that this was an example of glomerular nephritis following not measles, but scarlatina. Amongst these observations are many remarkable instances of metastasis of gout, of which, I venture to believe, we now see fewer examples than did the physicians of the eighteenth

century. To mention but one, the frequency of erysipelas, in Parry's time, as a precursor and a sequel of gout is certainly not recognised in these days. (James Gregory, of Edinburgh, noted the frequency of facial erysipelas in the daughters of gouty men.) Caleb Hillier Parry was a great physician, and it is not sufficiently known that he anticipated Graves in the recognition of ex-ophthalmic goître, and was possibly the first to describe the visual phenomena of megrim known as teichopsia, a fact which has been fully set out in his learned work on *Megrim and Sick-Headache* by our present Registrar.[1]

The ordinary conception of a sequel is the occurrence, sooner or later, after recovery from an illness is seemingly established, of new symptoms and physical signs of disease either near to, or remote from, parts which had been the seat of disturbance in the original malady. Some of these have long been recognised, and little surprise is felt when they supervene, though we may never have been able to predict their certain onset. Amongst such may be mentioned the occurrence of various palsies after diphtheria, and of rheumatism, with cardiac complications, after scarlet fever. However we may explain these,

[1] Dr. Edward Liveing, 1873.

they are true sequels, albeit they may be inconstant, and only ensue in a proportion of cases of these disorders.

Throughout our present inquiry we shall do well to bear in mind the following apothegm of Sir William Jenner, to the effect that "the invariable antecedent of any given event is not necessarily its cause. Invariable antecedent and invariable consequent are not synonymous with cause and effect."

I shall endeavour to find a reply to the very pertinent inquiry which Sir James Paget has suggested—whether each disease does not leave, after it has ceased, certain conditions of blood or structure which, sooner or later, may manifest themselves in what may be named a residual disease. He remarks that of the soon-occurring sequels of disease we know many; of the later, comparatively few. We shall find that our knowledge of the later sequels has been enlarged within quite recent date, especially in regard to the large class of specific and infectious diseases. The question relating to latency of such peccant matters as may sometimes, after very long intervals, be roused into activity and afford characteristic signs is one of large interest, and receiving some attention at the present time. We have to

determine what are the limits of duration of latency, and, in any given instance, to prove, if possible, that these specific and toxic residues have remained latent, and have not been re-introduced from without. We have to learn what conditions of the tissues and of the blood dispose to and determine latency, and further to ascertain in what forms, particulate or other, germs or toxins remain latent within the body.

We must look almost exclusively to the pathological laboratories for replies to most of these pressing inquiries. Such investigations call for the highest skill and experience from workers widely trained in animal chemistry, no less than in bacteriology, for they are beset with many pitfalls which are alone known to skilled observers. The physician who is conversant with the attested results of these researches is indeed well-equipped when he comes to his work at the bedside. But no less must his methods be clinical in the true sense. He has to observe facts as they come before him, to keep an open mind, to record what he finds, and then to seek to correlate and interpret the phenomena either by his personal intuition, derived from previous and wide experience, or by the aid of attested research bearing on the particular points in question. Above all,

he has to see things in due proportion, and not to be led away by any doctrines or views that may happen to be uppermost, or in fashion, for the time being.

We have next to consider the occurrence of new morbid conditions which appear to be determined by the previous incidence of definite disease. An example of this is perhaps afforded by the onset of the malady known as tabes dorsalis, which is now recognised as a not infrequent sequel in the subjects of constitutional syphilis.

It is found that in the subjects of tabes dorsalis syphilis figures to the extent of over eighty per cent., and it is hardly possible to believe that this far-reaching infection is not answerable for a very large proportion of cases of tabes. We cannot assign the specific spinal and cerebral lesions of this latter malady to any definite forms of syphiloma, neither morbid histology nor therapeusis affording any proof in support of such a contention; hence we are constrained to believe that the blighting influences of the infection of lues in some way predispose the subjects of it to subsequent specific degenerations in certain tracts of the spinal marrow, and thus we have to regard tabes dorsalis as one of the possible sequels of syphilis. One of our present Censors, pre-eminent

for minute scrutiny, and little ready to be satisfied with specious arguments, has declared in respect of this very question that possibly as large a percentage of syphilis might be discoverable, were it looked for, amongst the unhappy subjects of broken limbs in any surgical wards.[1] This may be the case, but I hardly see that it materially affects the proposition before us, and I think great force is added to the contention by the fact that when women, who are rarely the subjects of tabes dorsalis, suffer from it, they have frequently at an earlier period been the victims of constitutional syphilis. (I may add the authority of Dr. Buzzard for the latter statement.)

We shall find as we proceed how certain illnesses, as it were, test the constitution of the patient, and bring to light some phase or indication of his peculiar diathesis or habit of body, and this, it may be, for the first time in his life-history. In this way, scrofulous manifestations may supervene upon enteric or upon scarlet fever; and gout, or disorders of gouty nature, may come out after fevers or prolonged illnesses,

[1] Dr. Pye-Smith, *Lumleian Lectures*, 1892, p. 106. Dr. Pye-Smith, however, admits that the frequency of association of lues and tabes is greater than can be explained by coincidence.

neither tendency having previously been suspected. Such developments may fairly be regarded as sequels of the original ailments that primarily evoked them, for they might, possibly, never have been manifested, or have remained dormant till otherwise called into activity later on in life.

The study of convalescence from acute diseases is in itself a very large one. Our daily experience tells of the great differences to be met with in the rate and course of recovery from illnesses, differences attributable in each case to the age, life-history, diathetic predisposition, and the special environments of the patient. Sometimes, one's greatest anxieties respecting ultimate recovery only begin when the acute processes have subsided, and the patient has to be restored to his original level of nutrition and well-being. Especially is this the case after such illnesses as pneumonia or enteric fever, more particularly in elderly patients; and our surgical colleagues can bear witness to similar anxiety in cases where the powers of life are well-nigh exhausted in the inadequate healing of large wounds, and in the often protracted convalescence from chronic pyæmia.

In order that this inquiry may be as complete

as possible, it appears to me necessary to consider *seriatim* diseases as they affect the several systems and organs of the body, and to discover as we thus proceed what we know for certain in respect of any near or remote consequences which may arise from them. This may at first sight appear a somewhat tedious process, but it will prevent desultoriness and, presumably, some omissions.

I take first, then, for consideration the large class of *Specific Contagious Diseases.* We shall find that these, as might be expected, furnish many, indeed the greater number, of examples of sequels, some of which are well-recognised, others less so.

Our knowledge respecting this part of our subject has been greatly enlarged in recent years, especially in relation to sequels involving the cerebro-spinal system. We have to determine the causes of these, to discover if the sequels are as specific as the diseases which induced them in each case. We require knowledge as to the fact that sequels are inconstant, and, happily, form no ordinary part of the illness in the majority of cases. We are already in a position to affirm that the toxins resulting from specific organisms are the active agents in inducing certain sequels,

often at distant periods from the original illness which provoked them, and we have also evidence in proof of the fact that many of the later septical complications of specific diseases are dependent on the additional invasion of micro-organisms quite indirectly related to the original disease.[1]

We shall find further, as we proceed, that it is often hard to determine what is strictly a late complication, and what is strictly an early sequel. I shall try to make this point clear, but it will be found that it is often little more than a question of terms, the effective cause being the same in each case, the mere date of onset a little sooner or a little later. Both are certainly consequences. It has been pointed out, and reaffirmed of late by Osler, that, paradoxical as it may appear, persons rarely die of the disease from which they suffer. Secondary or terminal infections are the real causes of death; invasion, that is, by various and indifferent microbic elements which set up intercurrent sequels. Of these, the pneumococcus and streptococcus pyogenes are perhaps the most commonly met with, but the bacilli of diphtheria and of tubercle are by no means of infrequent activity in this relation.

[1] "Tendencies accompany, or conditions survive the fever."—*Sir Thomas Watson.*

Typhus Fever is now happily so infrequent that we have seldom means of studying it or its consequences. I myself have seen little of this disease in the last five-and-twenty years, but I was once familiar enough with it. The sequels of typhus are neither frequent nor numerous. Arterial thrombosis may occur, leading to cerebral embolism, and to plugging in the limbs, with consecutive gangrene. The latter event is more frequently met with in this fever than in enteric fever. Endocarditis was observed by Murchison in one case, leading to splenic infarction. Thrombosis of the femoral veins is not met with nearly so freqently as in cases of enteric fever. Tuberculosis, also, is less common after typhus than after enteric fever, but the depressed nutrition of the body following typhus certainly predisposes to an outbreak of tuberculosis in persons constitutionally predisposed to it, or who may already be the subjects of it in a quiescent condition. Murchison described a case where symptoms occurred which would now be referred to peripheral neuritis, leading to various palsies of motion and sensation, and a remarkably infrequent action of the heart, which latter condition remained for many years. The paralytic symptoms disappeared, and the general health was restored.

Peripheral neuritis probably accounts for most of the paralytic conditions noted by the older physicians as occasional sequels of typhus fever. Muscular atrophy, leading to club-foot and other distortions, may be met with, and remain for the rest of life. Mania is occasionally seen as a sequel, but is generally recovered from. Whenever symptoms of mental alienation are witnessed as sequels to acute diseases, my opinion is that there is always in such cases a neurotic proclivity, and an inherited mental instability, which thus declares itself under the lowered vital condition of the patient. I have seldom failed to find evidence in support of this view after full inquiry into the family history. Acute nephritis has been known to occur and lead to chronic tubal nephritis, but this is exceptional. Optic neuritis is rarely met with.

Peritonitis was noted once, if not twice, by Jenner during convalescence from typhus, and no cause being found for it after death, such as perforation of the bowel, he regarded it as idiopathic.[1] This is so rare a sequel that the case is very noteworthy. It occurred in a girl of sixteen years of age on the fifth day, after the fever had passed away, began suddenly, and was accompanied by

[1] *On Fevers and Diphtheria*, p. 313, 1893.

all the symptoms indicating perforation of the bowel. Death followed in two days.

Typhus fever is a grave malady for persons of a gouty habit. Murchison never knew of recovery in such a case.[1] The explanation of this fact is that the subjects of well-expressed gout have commonly inadequately acting kidneys, and typhus fever is always fatal in persons with Bright's disease in any form. Renal integrity is absolutely necessary for recovery from typhus. Further, such patients are commonly of an age at which typhus is apt to be fatal, recovery being most rare at or after fifty years of age, however sound the kidneys may appear, degenerative changes having already begun in the body.

Relapsing, Famine, or Spirillum Fever.—The sequels that have been noted after this disease appear to be largely dependent on the previous low health of the patients. Anæmia and feeble action of the heart have been noted, accompanied by palpitation and characteristic murmurs. Muscular and arthritic pains, partial paralysis of the deltoid muscles and those of the arms, with numbness, have been recorded as lasting for several weeks. These pass away with the full establish-

[1] *Vide* Duckworth, *Treatise on Gout*, p. 208, 1890; Murchison, *Treatise on Continued Fevers*, p. 227, 1862.

ment of convalescence. It is not improbable that these paralytic symptoms are due to peripheral neuritis. Ophthalmia is a peculiar sequel. It has been observed to begin from three weeks to eight months after the fever has subsided. *Muscæ volitantes* are complained of, and luminous stars. This is described as the amaurotic stage. After an interval of weeks or months, the retina becomes inflamed, and this process generally involves the other structures of the eyeball. The conjunctivæ are little affected, but there is great pain and lachrymation. The course of this disease is tedious and the sight may be lost. One eye alone is commonly involved, chiefly the right. Two months may elapse before this ophthalmia subsides. It is rarely met with after middle life. Exposure to cold appears to be the exciting cause, and the extreme debility of the patients has, no doubt, much to do with it. This peculiar condition is not met with after typhus or enteric fevers. Erysipelas is noted amongst sequels of relapsing fever, and may prove fatal. Boils sometimes occur during convalescence. Inflammatory effusion into the joints of the knees, hands, and jaw may occur. Dysentery, after convalescence, has sometimes proved severe, and even fatal. Pregnant women invariably abort, and the child is born dead, or

soon dies. (Abortion is rare in typhus fever, and if it happens, the child usually lives.) Severe or fatal hæmorrhage is the rule in abortion after relapsing fever. The spleen may remain enlarged during convalescence. Œdema of the lower limbs is an occasional sequel, and appears to be independent of any venous thrombosis, and therefore due to debility and impoverished blood. Gangrene is very rarely met with after relapsing fever. In reviewing this series of sequels, it is not at present possible to connect any of them directly with the presence of the spirochæte Obermeieri in the blood. We can hardly doubt that some of them are due to this specific bacterium in some stages of its development or dissolution, or to certain toxins produced by it. It is certain that a low level of health induced by privation and insanitary conditions directly predisposes persons so exposed to fall victims to the disease in its gravest forms.

Enteric Fever.—The sequels of this disease are numerous and varied. They are now commonly recognised.[1] I will consider them in the order in which they most frequently occur.

[1] *Vide Clin. Lectures and Essays*, Sir J. Paget, 1875, p. 395; *Studies of Old Case Books*, Sir J. Paget, 1891, p. 98; *Treatise on Continued Fevers*, C. Murchison, 1873 (2nd edit.); "Case

Phlebitis is perhaps most often met with, and the left femoral vein is the commonest site of it. It is of more frequent occurrence in this disease than in typhus fever. Symptoms pointing to this condition may arise as early as in the third week of the fever, or in the fourth week. In such cases we are hardly justified in reckoning it as a sequel, rather it should be considered a complication. In a prolonged case under the care of my colleague, Dr. Church, phlebitis set in on the fifty-fifth day in both legs, and prevented the patient from rising till the sixty-ninth day of the illness. As a rule, the sequels of enteric fever are met with when convalescence is fairly well or apparently completely established. Phlebitis is certainly amongst the earliest sequels, and does not always give rise to constitutional disturbance. The process may be accompanied with severe pain in the site of it, or it may be painless.

of Muscular Atrophy and Gangrene of the Lung after Typhoid Fever," T. W. Shore, M.D., *St. Barth. Hosp. Reports*, vol. xxiii. p. 109, 1887 (with admirable bibliographical notes); "Nervous Sequelæ of Infectious Disease," H. Handford, *Brit. Med. Journ.*, Sept. 21, 1895, p. 702; *Manual of Diseases of the Nervous System*, vol. ii. p. 895, 2nd edit., W. R. Gowers, 1895; "Report on Typhoid Fever," "Studies in Typhoid Fever, etc.," "Neuritis during and after Typhoid Fever" (W. Osler), *Johns Hopkins Hosp. Reports*, vol. v. 1895.

Pain may be also present or absent in phlebitis, dependent on other conditions such as gout or anæmia. The duration of phlebitis varies, and the effects likewise. Complete recovery is the rule, but there may remain permanent obstruction of the affected vein, with compensatory enlargements of adjacent ones, and some inability in the limb, with tendency to slight œdema for the remainder of life. There is sometimes reason to suspect that some of the pelvic veins are involved in this condition, though no very clear physical signs of it may be detectible. Suppurations do not result from post-enteric phlebitis, nor are instances on record, so far as I am aware, where any detached particles of clot have been embolically lodged elsewhere in the body, though the possibility of such an accident should not be forgotten. Paget regards the thrombosis as secondary to the inflammation of the coats of the vein. Bradycardia sometimes remains after convalescence.

Arterial plugging sometimes occurs. It is hardly to be reckoned as a sequel, since it is rather a late complication. The femoral artery is most often affected, and gangrene rapidly ensues. This event is of less frequent occurrence after enteric than after typhus fever. The condition is

that of thrombosis and not of embolism, and in most cases a fatal result ensues. Osler records a case in which the left femoral artery was blocked on the sixteenth day of the fever. In a case now under the care of my colleague, Dr. Hensley, in St. Bartholomew's Hospital, there was pain in the right foot with coldness and asphyxia, and absence of pulsation in the femoral artery on the forty-seventh day, continued fever having been present, without any relapse, in a young woman of twenty-one years. The heart-sounds were clear, but feeble, and the first one was reduplicated. Dry gangrene made slow progress in the foot and lower third of the leg. Pulsation gradually returned in the femoral artery. On the eighty-ninth day of the illness, Mr. Howard Marsh amputated at the junction of the upper and middle third of the limb, and the case has proceeded, so far, very satisfactorily. The muscles presented signs of fatty degeneration. (Perfect recovery ensued.)

Periostitis and Perichondritis. — These are sequels which may present themselves at periods long after convalescence is well-established. Old fistulous openings may show signs of activity, and lead to areas of subjacent necrosed bone. Simple periostitis may occur without any necrosis of

bone. The common site is the tibia. Both tibiæ may be symmetrically affected, but this is rarely the case. The disorder may occur within a month of full convalescence. I met with three examples in five years amongst my hospital in-patients. In one case, seen in private practice, three months had elapsed before this sequel came on. In another case periostitis occurred before convalescence was complete. The femur, ulna, ribs and cartilages, and the parietal bones have been noted as liable to be affected. Nodose swellings, with heat and pain, are generally first recognised. These often subside, but may break down, and dead bone is to be felt with a probe. Long periods may elapse before a necrosed lamina is expelled, and tedious suppurative discharge may be expected until this separation is effected. The disorder is generally more tedious when a rib with its cartilage is involved, and a year, or even two years, may pass before all becomes quiet. The bones are not deeply involved as a rule. This sequel may occur in persons whose constitution has been, and still remains, sound; and it does not appear that this condition betokens any evidence of scrofula, although when a rib is involved the likeness of the disorders to ordinary scrofulous periostitis is, according to Paget, singularly close.

The latter authority has described a case in which the eleventh or twelfth rib being involved, a great abscess made its way between the abdominal muscles, and had to be opened in the groin. In one case which came under my care, the patient, an officer, aged twenty-eight, had enteric fever in August 1892, while serving in India. Five weeks after convalescence an abscess formed near the sternum over the cartilages of the left fifth and sixth ribs. Mr. Howard Marsh undertook the surgical treatment of the case. The general health was excellent, but the local condition proved most tedious. An abscess was found behind the rib in front of the parietal pleura. The sinuses in connection with it, and the indurated swellings of the cartilages, were long in healing, and the parts were not fully sound till after the lapse of two months. Most bone-lesions occur within two years after the original attack of fever.

Deep scars usually remain. Necrosis of the ribs is met with sometimes, but is less frequent here than in the tibiæ. The periosteum may long remain inflamed. Paget records an instance where repeated attacks of pain and swelling occurred, without suppuration, for three years. Permanent thickening of the periosteum remained. In another case, he met with a recurrence of peri-

ostitis after nine years of apparent soundness. Men suffer more often than women from post-typhoid bone-lesions, probably owing to exposure to injuries and strains.

The cartilages of the larynx may become necrosed, also the arytenoid cartilages. The latter have been found thus involved and accompanied with an abscess in post-mortem examination, and therefore this condition may not perhaps be regarded as a true sequel. This necrosis may lead to general emphysema. The larynx may be affected directly by a specific ulcer, which is not infrequent on the vocal cords or on the epiglottis.[1]

Phlegmonous cellulitis of the orbit has been observed as a sequel, also orchitis followed by epididymitis, suppurative parotitis, ovaritis, salpingitis, nephritis, tubal and suppurative, and

[1] Such cases are well-described and discussed in the "Toner Lectures," (lect. v. vol. xv. of *Smithsonian Miscellaneous Collections*, by W. W. Keen, M.D., of Philadelphia, Feb. 1876), Washington, 1878.

Vide also remarks by Dr. Church, p. 104, *St. Barth. Hosp. Reports*, vol. xvii. 1891. These cases appear to be less common in Britain than in France and the United States.

Kanthack recently met with a case of enteric fever which proved fatal, in which an ulceration of the larynx was found charged with true bacilli of diphtheria. This was clearly an example of concurrent or mixed infection unsuspected during life.

suppurative thyroiditis. Various affections of joints have been described as sequels. Chantemesse, of Paris, who has very fully studied this subject, tells of a case of hypertrophic osteo-arthritis which ensued two and a half years after an attack of enteric fever.[1] The small joints of the hands and feet and of the cervical spine may be affected. These cases are rarely seen in Britain. They must be distinguished from pyæmic arthritis, which sometimes occurs at the end of a case of enteric fever, which merges into a general pyæmia, due to other microbic invasions than those of the specific bacillus of Eberth—mixed infection. The cases referred to here are apparently more often encountered in the United States of America, and have been described at length by Dr. W. W. Keen of Philadelphia.[2] The larger joints are chiefly involved. Suppuration is rare, but ankylosis may occur. Dislocations sometimes arise—"distension luxation." Synovitis is first observed, and may arise spontaneously, or occasionally, from periostitis or necrosis extending into the joint. In a series of forty-three examples collected by Keen, the lower extremities were affected in thirty-nine, the upper in only seven; three of the cases involving a joint

[1] *Soc. Med. des Hôpitaux*, Juill. 1890. [2] *Op. cit.* p. 3.

in both, for, though commonly monarticular, two large joints may be affected together. Pain is noted as but slight, but Chantemesse describes nocturnal osteocopy, analogous to that of syphilitic bone-disorders, as not uncommon in cases of post-typhoid periostitis, and pain in the affected joints as simulating that of rheumatism.

Marasmus is sometimes a sequel of enteric fever, and may occur in various degrees, the patient never regaining his former trophic level. Anæmia is occasionally seen but is commonly recovered from. I have known of several instances, and heard of others, in which patients have declared that they enjoyed better health than they had before they suffered from this fever. Deafness has been noted as a sequel, or perhaps, more correctly, as a symptom towards the end of the illness. Tinnitus aurium is not uncommon in the earlier course of the disease. Neither may be regarded as unfavourable. Mental weakness may occur, the patient becoming silly and childish after the decline of fever, and remaining so for some weeks. This intellectual failure is commonly temporary.[1] In some cases there is an extra-

[1] "On some of the Nervous Phenomena of Typhoid Fever," by F. W. Andrewes, M.B., *St. Barth. Hosp. Reports*, vol. xxv. p. 127, 1889.

ordinary silence, an inability or disability for speech. This is apt to follow as the deafness passes off. In one instance under my care a young girl, though perfectly conscious, remained silent under all conditions, and often in presence of her relatives, for thirty-five days. She was naturally bright and lively. In another case under the care of my colleague Dr. Church, a boy of nine years old remained silent for fifty-four days. The fever was severe in both cases. Much muscular wasting occurred in mine, but perfect recovery followed. In Dr. Church's case, great stupor occurred at the end of the third week, the right arm and leg were paretic, consciousness hardly returned till the fortieth day, when the boy could move his right limbs. The sphincters were unstable till the sixty-ninth day. A perfect recovery followed.[1] Choreiform movements have been noted in association with disability for speech in one case.[2] Paralysis of the vocal cords has

[1] This condition is well-discussed by Dr. J. Christian Simpson in a report of a case of "Enterica with Nervous Sequels," *Edin. Med. Journ.*, Jan. 1896.

[2] De la Harpe: quoted by Gowers. An interesting observation in view of the theory held by myself and others that chorea is rheumatism of the brain, specially involving the cortex. *Vide* "The Rheumatic Nature of Chorea," *Lancet*, April 7, 1894.

been observed. In two cases both abductors were so involved as to necessitate tracheotomy. In another case, with much muscular wasting and sensory disturbance, one cord was affected. Recovery was complete. The distinction between central and peripheral palsies is often difficult, and is chiefly determined, according to Gowers, by noting the presence of pains in the limbs and the existence of tenderness in nerves.

The condition of silence just referred to is no true aphasia, but is almost certainly due to exhaustion of cortical nerve-areas, to enfeebled circulation of impoverished blood, and, perchance, to direct and specific fever-poison. Active mental derangement, with delusions, may supervene after apparent recovery, also melancholia.[1] These conditions are generally recovered from, but evidences of cerebral and intellectual enfeeblement and defect of memory, may remain for many months, or even permanently, after severe attacks of enteric fever. Minute changes have been met with in the brain, of the nature of small inflammatory foci. Recent researches plainly indicate that the spinal cord may suffer from residual disorders after infectious fevers, and especially after enteric fever. Dr. Handford has described a case

[1] Osler records three cases as having occurred in 229 patients.

of general muscular wasting in a boy aged eleven years, the limbs and trunk being especially affected. The knee-jerks were absent, but the other reflexes remained. Enteric fever occurred at the age of five years, and there was inability to walk for two months after convalescence was established. The arms became enfeebled after the legs. At the age of nine years scarlet fever occurred, and the muscular wasting made subsequent rapid progress. There were no electrical indications of any qualitative change in the muscles, and the condition was apparently one of anterior poliomyelitis. This affection is believed by Gowers to follow upon enteric fever more frequently than after any other of the infectious diseases.

Disseminated patches of sclerosis of the cord have been found by Ebstein, and this condition is also considered to follow enterica with some frequency. Leyden has placed the nervous sequels of this fever in three categories :—

I. *Paralysis of single muscles or groups of muscles supplied by one nerve*, including cases resembling post-diphtheritic paralysis, facial palsy, strabismus, disturbances of ocular accommodation and palatal palsy, atrophic paralysis, with neuralgic pain and diminished electrical

reactions, paralysis of the radial and ulnar nerves, and other varieties. (These are regarded by Leyden as peripheral neuritic disorders and not of central origin. My colleague, Dr. Shore, has, however, described a very important case in which localised muscular atrophy occurred which was proved to be due to sub-acute myelitis of the grey matter of the anterior cornua, involving the origins of the fifth, sixth, and seventh cervical nerves. The patient, a woman, aged twenty-six, suffered from loss of power, first in the right, and later in the left hand and arm, three weeks after leaving the hospital convalescent from enteric fever. The extensor muscles of the forearms were wasted, and there was double wrist-drop. There were no sensory symptoms. No other paralysés were discovered. Death occurred in two weeks from pulmonary gangrene and pyo-pneumothorax, and this latter complication was believed to be due to trophic disturbance arising from the spinal lesion, no other cause for it being found).

II. *Paralysis of a spinal type*, including paresis of lower limbs, without atrophy and sensory symptoms; paresis with hyperæsthesia and rigidities, due to myelitis or meningo-myelitis; acute ascending paralysis (Landry); progressive mus-

cular atrophy, and acute ataxia with affections of speech and inco-ordination.

III. *Affections of a cerebral type.*—Psychoses, mania, melancholia, hemiplegia with aphasia, and with optic atrophy.

Osler groups neuritis as an accompaniment or sequel of enteric fever under two heads: (*a*) local neuritis; (*β*) wide-spread, diffuse, or multiple neuritis.[1]

Doubt has lately been thrown upon the nature of some of the neuritic sequels of enteric fever which so closely resemble post-diphtheritic palsies, since it has been suggested that they are not improbably due to a concurrent but unrecognised specific diphtheria. I have already referred to an instance of this. Murchison described a case in which this concurrence was met with. Palatine paralysis should perhaps be regarded as a symptom suggestive of this combination, but it may, however, occur together with general muscular weakness after enteric fever. According to Gowers, there is never the loss of accommodation or the slow progress of palsy from one part to another that is significant of diphtheria. Gubler, however, has recorded an example which, according to

[1] *Johns Hopkins Hosp. Reports*, vol. v. 1895.

Bury, is unique, where paresis of the palate occurred with nasal twang of voice, and paralysis of ocular accommodation.

Amongst the varieties of local neuritis, tenderness of the toes has been described by Handford and Osler, the pain being severe and the weight of bedclothes insupportable. The ulnar nerve is particularly apt to suffer. The cranial nerves may be involved, especially the third and the seventh branches. Optic neuritis is very rarely met with as a sequel. Enteric fever is probably followed by neuritis more often than any other infectious fever, with the exception probably of diphtheria and influenza. From a study of many cases Bury remarks that the resulting paralyses are usually partial in extent and degree, that the muscles affected are both wasted and weak, and that the paralysis is almost invariably preceded or accompanied by some form of sensory disturbance.

The muscular tremors which occur in severe cases of enteric fever may continue and be followed by symptoms of disseminated spinal sclerosis, but not by paralysis agitans. Tetany has been met with during the fever, and in convalescence after some epidemics. A condition described as "the typhoid spine" by Gibney of New York, and by

Osler, is met with sometimes late in convalescence which may confine the patient to bed for weeks. It is characterised by pains in the back, hips, and abdomen, shooting and paroxysmal, elicited by slight movements. It is sometimes associated with general debility, but not always. No evidence of spinal disease has been detected, though periostitis and spondylitis have been suggested as possible causes. Osler believes that the disorder is purely neurotic.

In his special report[1] on neuritis during and after typhoid fever he mentions having met with five cases of local neuritis amongst 390 patients. In two of these the disorder developed during the height of the fever. In the third case neuritis occurred when convalescence had been established for ten days. In the fourth case neuritis began after five weeks' illness, as the pyrexia declined. In the fifth case the disorder came on late in a tardy convalescence. In four examples of multiple neuritis, also recorded by Osler in his report, the disorder came on either late in the course of the fever, or somewhat early in the convalescence.

Paraplegia of considerable severity, though not complete, has been noted, accompanied with

[1] *Johns Hopkins Hosp. Reports*, vol. v. 1895.

spinal tenderness, hyperæsthesia, and sensory disturbance in the legs. It may pass off in the course of a few weeks, and is believed to be dependent on a slight degree of diffused myelitis. Increased knee-jerk and foot-clonus existed in one case seen by Gowers some months after the fever. Symptoms of more acute and rapidly spreading paralysis may sometimes supervene and lead to a fatal issue in the course of a few days.

Hemiplegia is very rarely met with, but two cases have been recorded of right-sided disorder with aphasia, and in one of them optic atrophy followed. Pleural effusions of all varieties may occur, but are not frequent. Empyema has been met with.[1] Dr. Hale White has recorded two cases in which pyo-pneumothorax was a sequel. The fever was protracted in each case. The lung gave way in both patients while straining at stool. One of these proved fatal. The other made a good recovery.[2] This accident may be explained by the softening of the pleura due to suppuration, or by the occurrence of rupture of a pulmonary abscess due to typhoidal or to mixed infection.

Perforation of a typhoid ulcer may occur late in the course of severe cases. The following example

[1] Weintraund, *Berl. Klin. Woch*, Jahr. xxx. No. 13, p. 346.

[2] "Clin. Soc. Proceedings," *Lancet*, Feb. 22, 1896.

is noteworthy, and my colleague, Dr. Brunton, kindly allows me to refer to it. A man, aged twenty-seven, came under his care on the fourteenth day of the fever. Hæmorrhage occurred on the fifteenth and eighteenth days. The fever subsided on the twenty-sixth day. On the forty-sixth day a relapse occurred and lasted eight days. On the eighty-sixth day symptoms of perforation of the bowel set in. The abdomen was opened eighteen hours afterwards by Mr. Bowlby, in the middle line, and a perforation was found in the ileum near the ileo-cæcal valve. The edges were pared and nine sutures were put in. The wound healed up well. The man left his bed on the hundred and nineteenth day, and is now in perfect health.

One of the most curious sequels I have met with was linear atrophy of the skin with extreme hyperæsthesia of adjacent parts in a young and vigorous Belgian gentleman. This began three months after a severe attack of enteric fever. Parallel stripes of discoloured skin were found on the outer side of the left thigh, depressed, and showing perfect characters of the well-known lineæ atrophicæ or "lineæ gravidarum." This condition was evidently due to a neuritis involving both sensory and trophic fibres of a specific

(typhoidal) character. Six months later I learned that the pains had much subsided and the colour of the stripes was fading, but recovery was not complete. I have found reference to several other similar cases as having been met with in this country, in France, Germany, and in Canada.[1]

Typhlitis is certainly not generally recognised as a sequel of enteric fever, but Barling has recorded an instance in which the vermiform appendix was involved in ulceration leading to stenosis. He believes that this resulted from an attack of enteric fever which had occurred five years previously.[2] The connection is, I think, at least doubtful, and I have never read of, or met with, a similar example.

Gangrene of the lung has been already mentioned as an early sequel in the remarkable case recorded by Dr. Shore. The history of that case plainly indicated that this condition was due to neuro-trophic disturbance. Sir William Jenner met with two examples after typhus fever, but with none after enteric fever. Murchison considered it a rare event, but had met with one or two instances. Probably in the majority of cases this

[1] *Vide Brit. Journal of Dermatology*, No. 62, vol. v., where I have recorded my case at length.

[2] *Brit. Med. Journal*, May 1895, p. 1135.

condition may be regarded as a complication rather than as a sequel. In Dr. Shore's case the occurrence was clearly an early sequel. Residual abscesses have been met with in the pancreas.

A crop of boils is recorded as a sequel, causing post-typhoidal pyrexia, in a case under the care of Dr. Osler.[1]

Enuresis, even of long duration, has been known to be temporarily cured after the occurrence of enteric fever.[2]

It appears certain that during convalescence there may be recurrences of pyrexia, which simulate, but are not truly, relapses of enteric fever. Putting aside such causes as may disturb any convalescent, such as emotion, constipation, &c., and cause temporary pyrexia, also such recognised sequels as periostitis, necrosis of bone, suppurative arthritis, pyæmia, erysipelas, phlebitis, and suppurative otitis media, we may note, according to Osler, a continued fever, lasting two or three weeks, apparently due to the profound anæmia which follows enterica. The temperature

[1] *Johns Hopkins Hosp. Rep.* on "Typhoid Fever," vol. iv. No. 1. 1894.

[2] Church, *St. Barth. Hosp. Reports*, vol. xvii. 1881, p. 107; Trousseau, *Clin. Med. Syd. Soc. Trans.*, vol. iii. p. 405.

may range from 99° to 101° F. Thus, in one case in which normal temperature prevailed for four days after convalescence, there followed a febrile period extending over sixteen days. The red globules were reduced by one third. The fever subsided as the blood-state improved, but ten weeks elapsed before the normal condition of the blood was attained. In another class of cases two or three weeks after convalescence, a rigor may supervene and a temperature of 104° or 105° occur on four or five occasions daily, or with intervals of a day or two of normal temperature, or of slight continued fever, and this for a period varying from two to sixteen days. No plain indications of the cause of this condition may be manifested, but it may be surmised that septic absorption has occurred from intestinal ulcers, from venous thrombi, or from a purulent focus in the spleen or a mesenteric gland. In two of Osler's cases in this series, numerous miliary abscesses were found in the kidneys, and in one of these typhoid bacilli were found, and no other microbes. In other cases, Eberth's bacilli were discovered in the kidneys, together with other microbes, viz., the bacillus coli and the streptococcus. Sterilised cultures of the typhoid bacillus were found to produce nephritis in animals. The

fact of ulceration of the bowels in enteric fever allows a ready entry into the system of specific bacilli, and Konjajeff has frequently found them in cases where albuminuria occurs in this fever. The kidneys appear to be one of the channels through which bacilli pass out of the body.

Having now considered the many and varied sequels which have been met with after enteric fever, we may seek next for a rational explanation of them. If we can discover this, we may fairly hope to find the clue to a settlement of the question not only in respect of this particular fever but of that which presses for solution in the case of all the specific infectious fevers and diseases. Modern bacteriological research leads us to regard it as highly probable, if not actually certain, that the toxins generated by the bacilli, specific in each case, are the active agents by which most of the sequels are induced in such instances. We have seen that many sequels may fairly be attributed to the extreme debility and exhaustion entailed by the acute manifestations of the disease. It suffices to examine with care the several viscera in fatal cases to be assured of the damage suffered in vital organs, which is to be fairly set down to pyrexia alone. The softening of the cardiac walls, the shrinkage of the liver, induced by atrophy

and molecular degeneration, the condition recognised as "cloudy swelling" of this viscus witnessed on section, and the like state of the kidneys, all point to grave trophic disturbance with inadequacy of metabolic, secreting, and other functions. Although these changes are most obvious in the organs just mentioned, we may feel sure that they exist in all the textures of the body, and must therefore, during life, have been potent for evil.

Similar acute degenerations occur, without doubt, though in lesser degree, in non-fatal cases, and we may cease to wonder at the low health, tardy recovery, and long failure to reach the normal level of health in these cases.[1] That special organs, or areas of tissue, should suffer more in some cases than in others is probably to be explained by inherent and personal weakness, since we know that such visceral weakness and textural defects are hereditary, and we may thus account for many varieties of ailments and peculi-

[1] According to the late Prof. Sir William Aitken, of Netley, no patient having suffered severely from enteric fever is fit to resume active or laborious duties for three or four months subsequently. In many severe cases, the patient has almost to be created anew before sound health is established, and a year not seldom elapses before this occurs, even under favourable conditions.

arities met with in patients. Acute illness tests the integrity and functional adequacy of such parts, and they break down under the ordeal, revealing to us one or another failure as a sequel.

We may thus speak of specific and non-specific sequels. In the former case, we have to reckon with localised residues of the primal disease, manifested by invasion of parcels of toxin-generating bacilli, working out their malign effects. Actual proof of this is not far to seek. It has been shown that such definite and local invasions occur, and fully account for the sequels. In the case of enteric fever, we have the researches of Chantemesse and Widal[1] showing the presence of bacilli in almost every tissue thus affected. These authorities affirm confidently that they have found the true bacillus of Eberth. My friend and colleague, Dr. Kanthack, however, informs me that these and other observers in France had not sufficiently learned to distinguish the bacillus coli from Eberth's bacillus at the time they wrote, and that thus some doubt must still exist as to these particular researches. In Osler's case, already quoted, and in other cases, no such

[1] *Bull. de la Soc. Med. des Hôpitaux*, Mars 1890.

doubt can be entertained. Sultan and Burchke discovered in one case, six years after an attack of enteric fever, and in another seven years after, living bacilli in abscesses of bone.[1] Gillet de Grandmont found Eberth's bacilli in the pus from a case of iritis, hypopyon, and posterior synechia which followed typhoid fever.[2] They have also been found in the clot in thrombosed veins after this fever. It is now proved that these bacilli are very tenacious of life outside the body, and can exist in a potato culture for at least two years.

Some of the sequels in enteric fever are not specific, but certainly due to invasion by other than the specific bacilli, to the ordinary microbes inducing suppuration, such as streptococcus, staphylococcus pyogenes aureus, and to the bacillus coli communis. These constitute mixed or terminal infections, and may be classed as septicæmic or pyæmic sequels, due to secondary invasion supervening, embolically or otherwise, on the specific

[1] Quoted by Dr. Washbourn, *Roy. Med. Chir. Soc. Proceedings*, Nov. 1895. *Vide* also Report by H. C. Parsons, of Baltimore (*Annals of Surgery*, Nov. 1895).

[2] Quoted by Mr. Sydney Stephenson, *Lancet*, Feb. 29, 1896, p. 543.

fever, by way of venous or lymphatic channels, from purulent foci in the intestines, mesenteric glands, or spleen. Schnitzler records a case where the staphylococcus aureus had remained latent in a bone for over thirty-five years.[1]

Typhoidal splenic enlargement is not always a simple matter. Rupture may occur on slight provocation, and has been known to occur even spontaneously, softened deposits thus passing into the peritoneal cavity, and setting up peritonitis.

In my next Lecture I shall complete what I have to say on this subject, and proceed to discuss the sequels of Scarlet fever.

[1] "On Traumatic Infection:" Lockwood, *Hunterian Lectures, R. C. Surg. England*, 1895, p. 42.

LECTURE II

In my last lecture I discussed at considerable length the varieties of sequels which may occur after enteric fever.[1] We shall not find so much to claim our consideration in respect of many other diseases. I was led to dwell in detail on most of the residual disorders of enteric fever, because it appears to me probable that we have in this instance a typical example of the several consequences that may supervene upon the occurrence of specific and infectious diseases generally, one which may well serve to illustrate for us the intimate nature of, possibly, the majority of bacterio-toxic sequels. With respect to relapses of enteric fever, which are frequent enough, I think we may fairly assume that they are significant of re-infections from the intestines or other

[1] My experience leads me to agree with Pye-Smith as to the generally non-fatal character of most sequels of enteric fever. The worst forms are those resulting from residues of mixed infective material which induce suppurative or pyæmic conditions.

parts of the body. Their short duration may possibly indicate some degree of immunization already secured by the primary attack. Their determination, not seldom, by improper food, or an incautious use of aperients, may admit of explanation by the irritant effects thus produced upon healing ulcerations. It is conceivable that these conditions may lead to fresh impregnation; but, in truth, we have as yet no certain knowledge on these points. Intelligent care in the treatment certainly aids much in averting relapses, and I agree with Pye-Smith in the belief that they are seldom fatal. The task of tracing the hitherto hidden causes of sequels in a large class of diseases is made easier, by far, when we have to study the evolution and manifestations of microbic elements which are known and accurately recognised. We have not this knowledge as yet in respect of several of the infectious fevers, but we are now fully justified in forming opinions speculatively regarding a similar ætiology for these, judging by the remarkable analogies that exist between those of which we have this knowledge, and those of which, up till now, we have not. That we are still in ignorance of the exact and particular nature of the elements which generate the toxins

of variola, varicella, scarlet fever, and some other diseases, is somewhat remarkable when the researches of so many competent observers, pursued with untiring industry in all the great schools of medicine, is considered. We can hardly believe that these elements will much longer elude the scrutiny that is now focussed upon them. The subject is of paramount importance, and we may feel happy in the belief that no amount of sentimentalism or fanatical obloquy, either in this country or in the United States of America, will long delay the progress of knowledge in this direction. To those whose humane efforts are still curtailed and chastened in this country, I would say, "Durate, et vosmet rebus servate secundis."[1]

I am indebted to my colleague, Dr. Kanthack, for knowledge of some recently recorded facts respecting the influence of typhoid bacilli. Dmockowski and Janowski have proved that these microbes, when injected into rabbits, are capable of producing suppuration, and the same occurs in dogs previously weakened by loss of blood, or whose subcutaneous tissues have been first injured; also if these bacilli be injected under scars. The bacilli are found to wander to

[1] *Æneid*, i. 207.

inflamed or artificially predisposed sites in from ten to twenty days after inoculation. These observers found typhoid bacilli in suppurative foci occurring after the fever, as in parotitis. They met with none escaping by the urine after the crisis of the fever.[1] In a case of ulcerative endocarditis which occurred in a patient suffering from typhoid fever, Kanthack found typhoid bacilli in the valvular excrescences. Janowski met with them in a case of fatal suppurative parotitis which followed seven weeks after the fever, when the Peyerian ulcerations were found quite healed. Wasserman, of Berlin, as the result of his researches, believes that the complicating lesions of typhoid fever are usually due to mixed infections, as he found both typhoid bacilli, streptococci, and others in these conditions. These are the latest contributions to the subject, and they have the merit attaching to the researches of inquirers whose competence for the difficult task cannot anywhere be disputed.[2]

Scarlet Fever in severe cases has many complications, and several sequels. Pleurisy is amongst the latter, and may be purulent from the first.

[1] Ziegler's *Beitrage*, xvii. 222–366.

[2] Chiari has found typhoid bacilli very constantly in the large bile-ducts and gall-bladder, and believes that they multiply in the latter situation.—*Zeit. für Heilk.*, Bd. xv. p. 199.

Endocarditis is not infrequent, and some cases of valvular heart disease met with in later life are probably attributable to this. I shall presently discuss the intimate nature of this condition. Sero-fibrinous or purulent pericarditis may develop during convalescence, also myocarditis, associated either with rheumatic or pyæmic conditions.

Lymphadenitis may remain, become chronic, and prove but slowly amenable to treatment. Osler records an instance in which the neck remained enormously enlarged, and surrounded by a mass of firm brawny glands for two years after an attack.

Multiple neuritis, with progressive paralysis and muscular wasting, may occur. Insular sclerosis of the brain and spinal cord is alleged to have followed scarlatina. The possibility of associated diphtheria must be borne in mind in some of the paralytic cases. Mania, idiocy,[1] insanity,[2] and melancholia have been recorded as sequels.

Handford quotes Dr. Griffiths, of the Nottingham Fever Hospital, for the facts that in 1500 cases, he met with two of chorea, one of disseminated sclerosis, and one of spastic paraplegia

[1] Nine cases in 2000 (Dr. Fletcher Beach). In most cases there was a family history of neuroses.

[2] Four cases in 1000 (Dr. Clouston).

(probably functional) lasting only a few weeks. Slight hemiplegia (recoverable) has been noted, in all probability due to embolism or thrombosis.

Optic neuritis may occur independently of organic cerebral change. Acute myelitis is noted amongst the sequels, and epilepsy with more frequency than after any other acute infectious disorder.

Nephritis is rather to be regarded as a phase of the disorder, or at least as a complication, and not a true sequel of scarlatina. It is a definite form, attacking primarily the glomerular system of the kidney. Although it so commonly supervenes on apparent convalescence about the third or fourth week, and while desquamation is in progress over the body, I think it should be regarded as part of the original disease. It is as specific as the cutaneous exanthem, and its significance may be taken to indicate an invasion of the kidneys by the microbic elements,[1] or their toxins, as yet not eliminated from the body, and possibly finding their way out by this emunctory channel. The occurrence of dropsy in some cases without albuminuria lends support to the old idea that the anasarca is probably a specific inflammatory exu-

[1] Some variety of streptococcus pyogenes.

dation into the integuments and cavities. It is rare for such cases to recover ultimately without some degre of albuminuria.[1] Cirrhosis of the liver may be a sequel of scarlatina. Barlow and others have noted this, and an interstitial overgrowth has been frequently observed in the livers of patients who have succumbed to the disease.[2] I noted one such case in a child of five years who had had scarlatina two years previously. There was "hob-nail" cirrhosis and nephritis.

The sequels of otitis media suppurativa, perforation of the tympanic membrane, suppuration in the labyrinth, and necrosis of the petrous bone, may be far-reaching and tedious.[3] Facial palsy, thrombosis of the lateral sinus, meningitis, and cerebral abscess may all ensue. Permanent deafness thus results. The tonsils may remain permanently enlarged. Goodhart records two cases of torticollis as a sequel. Suppurative peritonitis, enteritis, chronic diarrhœa, symmetrical gangrene,

[1] *Vide* Paper *St. Barth. Hosp. Reports*, vol. xix. 1883, by Dyce Duckworth.

[2] Klein.

[3] Mr. Charles Parker has lately expressed the opinion that this sequel is probably due to the rapid development of post-nasal growths (adenomata) and considers it important to examine early for such, and to remove them as soon as possible after convalescence. *Post-Nasal Growths*, p. 13, 1894.

noma, and perforation of the palate have been noted, though rarely, as sequels. After enumerating such a grievous list of troubles as this, it is interesting to know that in recent years this terrible pest has been present in a somewhat milder form, and that, therefore, the gravest sequels are rather less commonly met with than was the case five-and-twenty years ago. The disease has generally been of a severer type in this country than on the continent of Europe, and consequently is regarded with greater apprehension amongst ourselves.

The arthritis which occurs in connection with scarlet fever has been carefully studied only within a recent period. It has commonly been regarded as "rheumatic," or, at all events, as rheumatoid. Henoch proposes for it the term "scarlatinal synovitis." Goodhart believes that some cases are truly rheumatic, and others, such as suppurative arthritis, are pyæmic in nature. There is an apparent analogy between scarlatinal and gonorrhœal rheumatism (so-called) the former being regarded as a pyæmic infection from sores in the fauces. But articular disorder occurs in the course of scarlatina *sine anginâ* when there is no source for infection from the fauces; and

endocarditis may also be present in such cases. As indicated by Dr. Archibald Garrod, it is the association with arthritis of a series of other rheumatic phenomena which points to the truly rheumatic nature of the process, at least in some instances. Thus, endo- and pericarditis may occur, and chorea may supervene. Subcutaneous nodules may appear, also erythema nodosum and marginatum. With these facts before us it is, I think, impossible to disregard the conclusion that scarlatina strongly predisposes to rheumatism, and my belief is that the occurrence of it will be found most frequently, if not solely, in children of an inherited arthritic diathesis, an opinion of M. Peter in which I fully concur. This and other forms of zymotic disease may so test this habit of body as to awaken and reveal a rheumatic tendency hitherto dormant in the patient.

I am indebted to Dr. Dickinson for his observation that the onset of true rheumatism following scarlatina is especially apt to be succeeded by chorea, the latter, as I regard it, being a cerebral (cortical) manifestation of rheumatism.

In my opinion then, we may regard it as nearly certain, first, that true rheumatic complications and sequels may be met with in scarlatina, and

secondly, that varieties of arthritis, due to septic or pyæmic influence, may also occur. Of the latter, Dr. Ashby describes an early and late form, the latter occurring during desquamation. A purulent arthritis is rare.[1] We shall subsequently find that measles may act, as does scarlatina, in evoking rheumatic manifestations, or in preparing the way for them.

Measles is occasionally followed by chronic

[1] An excellent account of such cases is recorded by Bellingham Smith and Mary Sturge (*Vide Brit. Med. Journ.*, Nov. 16, 1895, p. 1213). They met with nine examples of purulent arthritis in 5000 cases. The joints were attacked in the following order of frequency (in 45 published cases): wrist and hand, elbow, ankle and joints of foot, knee, hip, and sterno-clavicular joint. The time of onset was from the third to the fifth week of the disease, chiefly early in the fourth week, or concomitantly with the onset of nephritis. Cardiac lesions were not commonly present. The arthritis varied from a simple serous to a purulent and destructive form. The simple form is generally called scarlatinal rheumatism. Streptococci were found in the serous effusions. Some cases were purulent from the first. The throat is the common source of infection, but empyema and peri-arthritic abscess may be the original focus. Epiphysitis was not met with, though it was common in the great Dublin epidemic of 1834–1842, according to Kennedy. Septic thrombosis of the jugular veins was not met with. *Vide* "The Polyarthritis of Scarlet Fever," by Henry W. Berg, M.D. (a thoughtful and practical essay on the whole subject), *Pediatrics*, vol. i. June 15, 1896, No. 12, p. 551, New York and London.

catarrh of the bronchi and lungs. Tuberculosis may become generalised, probably starting from a source in the bronchial glands or from patches of broncho-pneumonia. Enlarged tonsils and lympharia may remain long after the illness. Post-nasal glandular growths may occur as a sequel. Some observers mention the occurrence of endocarditis. I have never met with an instance of this. Rheumatic fever, however, sometimes supervenes on measles, and the latter condition appears to evoke rheumatic manifestations in predisposed subjects. Endocarditis (rheumatic, not morbillous) may be one of these.[1] Cancrum oris and gangrene of the vulva have been noted. In feeble children, destruction of the nasal cartilages, and necrosis of the upper or lower jaw may result. A case of post-morbillous disseminated myelitis has been described by Barlow, with rapidly spreading paralysis, and a fatal issue on the eleventh day. Paraplegic symptoms due to polyneuritis have also been witnessed.[2] Dawson Williams has

[1] Sansom records a case in which chorea with pericarditis and endocarditis developed during convalescence from measles. J. H. Hutchinson also records four cases in this connection. *Med. Chir. Trans.*, vol. lxxiv. p. 229, 1891.

Bury states that sixty cases have been described up to

described an instance of false disseminated sclerosis of the cord as a sequel. Diarrhœa from intestinal catarrh, and dysenteric symptoms due to colitis, have been noted. The kidneys very rarely suffer. In 103 cases of acute nephritis collected by Dickinson, measles was noted as an antecedent in only three cases. A condition of low health may long remain after an attack of measles, with a general vulnerability of most of the textures of the body. Dr. Fletcher Beach met with 11 cases of idiocy which followed on measles out of 2000 cases, and, *per contra*, Dr. Colman reports two cases of mentally backward children who both began to improve after measles. According to Barlow, infectious diseases are found to reinforce pre-existing nerve-lesions, and he gives, as an instance, the case of a child with infantile paralysis of the lower limbs who contracted measles, and, after the paralysis had become general, died comatose during the infective period.

There has long been observed a relation between pertussis and measles. Dr. Charles West is of the opinion that the occurence of any one

1893 of paralyses, of cerebral or spinal origin, developing during the course of, or in early convalescence from, measles. Some of these were probably due to multiple neuritis.

of the eruptive fevers during the epidemic prevalence of another increases the liability to become affected with that which is epidemic, and that thus pertussis may supervene upon either measles or varicella. Dr. Goodhart noted the occurrence of pertussis 14 times after measles in 305 cases of the latter. The same may be said of membranous laryngitis (diphtheria) which sometimes co-exists with, or follows shortly after, an attack of measles.

We have here an illustration of what may be termed a succession of diseases, one preparing the way, as it were, for another. The following series of illnesses in a family of three young children indicates fairly well what I mean (albeit the intervals between the several disorders were somewhat protracted). In the middle of June 1895 all had measles. In November all had hooping cough. Post-nasal adenomata occurred in one child as a sequel, and were removed. In January 1896 all these children had chicken-pox. Occurrences of this kind are by no means uncommon.

No sequels are known after *Rubeola* (German measles). Nephritis sometimes, but rarely, persists.

Variola is sometimes followed by peripheral neuritis, or a diffuse myelitis which may cause

paraplegia—*ataxie-variolique*. The pharynx may be paralysed alone or with other parts, as after diphtheria, from multiple spreading neuritis. Hemiplegia with aphasia sometimes follows encephalitis. Epilepsy, mania, and melancholia have been met with, also disseminated cerebro-spinal sclerosis.

Boils are not an infrequent sequel, and local gangrene may occur. Suppurative arthritis, epiphysitis, and necrosis of bone, also otitis media, iritis, and cyclitis may give trouble long after convalescence has been established. A grave degree of anæmia sometimes ensues after variola. It is hardly possible to entertain any doubt that most of these sequels depend upon disseminated invasions of micro-organisms—specific, or mixed toxic infections.

Parotitis in the milder forms has no sequels. In the severe forms meningitis is the gravest complication, and hemiplegia and coma may result. Such cases are generally fatal. Metastasis to the testis is rare before puberty, and atrophy of the organ may occur, with hindered development of it, if it occurs early in life. Albuminuria, uræmia, endocarditis, peripheral neuritis, also acute mania and insanity, have been recorded as sequels of mumps, but are happily most of them infrequent.

The pancreas appears to suffer in no degree from the specific toxin.

Permanent deafness may result. Optic atrophy has been noted.[1] Arthritis has been observed to follow the subsidence of parotitis, and is probably one of the manifestations of the specific poison of this disease.[2]

Pertussis is not seldom followed by chronic bronchitis with pulmonary emphysema. Hemiplegia is rare as a sequel.[3] It may occur in a paroxysm of cough. The associated bronchopneumonia is sometimes of tuberculous nature. Enlargement of bronchial glands is of frequent occurrence, and one or more of them, especially at the bifurcation of the trachea, may prove infected with caseated tubercle, and lead to subsequent general tuberculosis. It is suggested that cardiac

[1] Dr. Caleb Parry records a case of orchitis following parotitis in which obstinate suppression (? retention) of urine occurred, long requiring the use of the catheter.

Cases of secondary parotitis are of extreme interest. Stephen Paget and others have well-described them. They do not, however, concern us in these Lectures, inasmuch as they may all be classed as complications rather than sequels of disease. I may refer the reader to an excellent essay on the subject by Dr. Hawthorne, of Glasgow, published in the *Glasgow Med. Journ.*, July 1895, with a complete bibliography of the subject.

[2] *Treatise on Rheumatism*, by A. Garrod, p. 186, 1890.

[3] *Vide* case recorded by R. G. McKerron, M.B., *Brit. Med. Journ.*, Sept. 12, 1896, p. 651.

valvular disease may be induced by long-continued strain upon the heart, and give rise to urgent symptoms in the future. Neither albuminuria nor glycosuria, if present, tend to persist, and the same may be affirmed in respect of the pulmonary emphysema which so commonly arises, and of the interstitial emphysema which occasionally occurs, owing to rupture of the lung or trachea in a paroxysm of coughing. Pertussis is sometimes responsible for the supervention of post-nasal adenoid growths. Hæmorrhage into the adrenal bodies has been met with, due to the violence of the cough checking the flow of blood into the veins.[1]

Varicella has no true sequels save in respect of changes which may occur in the rash. Prurigo may result, so-called varicella prurigo (Hutchinson). Ecthymatous sores, resembling pemphigus, are sometimes met with. The vesicles may become gangrenous in delicate or tuberculous children, and the result is probably due to the supervention of extraneous microbic infection, and not to the influence directly of varicella poison. Like the eruptive fevers, varicella may be followed by pertussis ; a lowered condition of health thus induced paving the way for fresh infection with increased susceptibility to it.

[1] Museum St. Barth. Hosp., 2320 A. Child æt. seven months.

Influenza.—The sequels of this disorder have only been studied with care in the course of the epidemics which have prevailed in the last seven years. They escaped the attention of the older observers. They are very numerous. It may be fairly affirmed that many of the gravest characters of the malady occur after the acute stage has passed away, and when convalescence is apparently assured. I think there has possibly been exaggeration in respect of some of the alleged sequels of influenza; still, they are, as I have said, numerous. The general asthenic type of the disease is well-recognised. The enfeebled mental and bodily states left behind it have been forcibly and sadly brought home to most of us of late, both in our own persons and in our patients and friends. Recognising the fact that each epidemic is signalised by a dominant form for the most part, we may discuss the particular sequels attending first the *thoracic*, second, the *gastro-intestinal*, and third, the *nervous* varieties of influenza.

The personal factor comes in here strongly in respect of each individual affected, and, as has been said, "each patient convalesces according to his temperament," and, no less, I would say, his diathesis. Nearly sixty years ago, Sir Henry Holland noted the long persisting influence of this

disease upon the constitution as a remarkable feature; also, the variation of parts affected in different individuals, or at different periods in its progress. In respect of sequels ensuing on the thoracic forms, we may note the prolonged course of the peculiar broncho-pneumonia, so often fatal to the weak and the aged in its earlier stage. Next, the onset of tuberculosis. Pre-existing tuberculosis may be roused into serious activity. Abscess of the lungs has been several times met with supervening on pneumonia, and Pfeiffer's bacillus has been found in the yellowish-brown sputa expectorated from it, together with elastic fibres from the lung. Hitzig[1] records a case in which careful examination proved the matter from the abscess to be free from strepto- and staphylococci, and from tubercle bacilli, and to contain only influenzal bacilli. Pleurisy is common, and empyema may result. Influenza has appeared to induce Graves' disease. The heart is often severely affected. Great weakness of the organ is common, arhythmia, bradycardia, tachycardia, and pseudo-anginal attacks with dilatation, may occur long after the illness. Vertigo is a very frequent symptom, a tendency to it persisting for months after an attack. Disturbance of the nervous mechanism

[1] *Münch. Med. Woch.*, Aug. 27, 1895.

of the cardiac reflex is more frequently met with than organic disease, changes probably occurring at the roots of the vagi, or in the cervical portion of the spinal cord. Pericarditis and endocarditis are but rarely encountered.

The gastro-intestinal variety of influenza may lead subsequently to vomiting, simple catarrhal jaundice, chronic gastro-intestinal catarrh, diarrhœa, or constipation, with marked nervous depression.

The nervous variety is apt to lead to many subsequent sequels. A rapid denutrition of nerve-centres is more or less common in all cases presenting any severity in the early stages. Neurasthenia may prevail for one or two years subsequently. Polyneuritis is a common sequel. The arms may be paralysed with both motory and sensory disturbance, and wrist-drop may follow; moreover, the same process may occur over large areas. Neuritis may involve cranial and other nerves locally. Encephalitis, myelitis, sclerosis of various tracts of the spinal cord, neuralgia, especially the intercostal variety, conjunctivitis, iritis, otitis media, mastoid abscess, malignant endocarditis, parotitis, orchitis, pemphigus, and lymphadenoma, with many other affections, have been noted amongst sequels in various recent epidemics in all parts of the world.

Somnolence, or extraordinary drowsiness, with hebetude, is sometimes a noteworthy feature. Headache, vomiting, and various mental disorders may occur. Melancholia, leading to suicide, is by no means uncommon. Mental incapacity long remains; and many patients, affected in middle life, tell of inability for efforts, mental and bodily, that were easy to them previously. They feel many years older in all respects.[1] The natural level of health may never be regained, or not fully re-established for two or three years after a severe attack. Abscess of the brain has been several times noted as a sequel, also simple lepto-meningitis. Dr. Harry Campbell has recorded a case in which a young man, a victim of hemicrania, lost this tendency after an attack of influenza. Mental affections may also sometimes subside after an attack. The sequels of this disease are doubtless often very varied, and often extraordinary. A medical friend of mine has been unable to take coffee, since he suffered from a severe attack in February 1895, without feeling considerable cardiac discomfort, although there was no arhythmia, and the heart-

[1] One of my patients, æt. 68, a former athlete at Cambridge, stated that he felt like a man of thirty-five till he had influenza Afterwards he felt like a man of seventy.

sounds remained normal. In this case, too, and in another, there remained for months subsequently a liability to paroxysms of low temperature, with extreme chilliness and distressing sensations; observations made in the mouth, axillæ, and rectum recording a temperature of only 96°. Such attacks continued to occur once in every eight or ten days, and not unfrequently in the night. (Nothing afforded so much relief as an ounce of whisky taken as hot toddy.) Anosmia has been noted as a sequel.

Influenza, in common with other infectious diseases, distinctly appears to predispose to the onset of other diseases. The lowered vitality induced by the primary malady leaves the patient a more ready prey to the attack of any other he may be exposed to. Sir William Broadbent has expressed the opinion that an attack of influenza may in this way determine the outbreak of enteric fever, the pyrexia of the former running on into the latter, so that the new malady may appear to be, as it were, a prolongation of influenzal fever. Or, a distinct interval may elapse between the one disorder and the other. Translated into the language of to-day, we may substitute for the term "lowered vitality" a condition of the solids and fluids of the body, in

respect of their powers of resistance to invasion by specific toxins, which is unequal to the struggle between them and the infection. We have already noted instances of a like kind in the cases of measles, varicella, and pertussis. It is also conceived by Broadbent and others, that germs of diseases may lie latent in the body, and remain inoperative till the resistance of the host is impaired by some circumstance, such as infectious or other illness, or traumatism, which forthwith liberates the latent germs with the consecutive onset of a fresh ailment. The occurrence, so frequently, of tuberculosis after injuries and infectious fevers, may possibly be explained in this way, also the development of tertiary syphilitic disorders.

Relapses of influenza are commonly met with, and may occur several times at fairly long intervals after the primary infection, and long after the original epidemic has passed away. We may doubt the occurrence of fresh infection from without, as by sporadic influence, in many such instances; and I think we may consider as probable a view of this matter for which I am indebted to our Registrar, Dr. Liveing. He conceives it to be not unlikely that the toxin of influenza may act very much as does that of

malaria, leaving behind it residues of specific infective matter which wake up into activity from time to time, and induce fresh outbursts of the disease in response to any conditions which temporarily lower the general vitality of the body.

We may thus regard such relapses as evidences of sequels of the direct residual class.

I have experiences of cases in which four or five attacks of influenza have occurred within two or three years, and at varying intervals. The conditions in respect of symptoms, type of pyrexia, and general character leave no room for doubt as to the true nature of the disorder; and intelligent patients—in three cases in the persons of well-known members of our profession—have recognised only too well the specific qualities of it.

Acute bronchocele has been several times observed to follow influenza. One lobe may become greatly enlarged and give rise to dyspnœa or orthopnœa, with a fluctuating tumour. Incisions give exit to viscid fluid, with relief to the symptoms, but the discharge may continue to flow for months—thirteen months in a case recorded by Dr. Browne of Alderley Edge.[1] In

[1] *Brit. Med. Journal*, June 8, 1895, and references to other cases in the Journal, May 2, 1895.

another case there remained enlargement of the gland for eighteen months, acute inflammation having begun three days after the influenzal temperature fell to normal.

One of the most remarkable cases I have seen occurred in a gentleman, aged 68, brought to me by Dr. Elliott, of Chester, in whom great wasting had occurred in the pectoral muscles. This followed an attack of influenza nine months previously. Twenty-eight pounds weight had been lost during that time. The ribs were plainly visible. There was marked difficulty of inspiration, and the upper portion of the chest hardly moved. There was no myoidema. The brachial muscles were soft, but those of the lower limbs were firm. There was general weakness and early fatigue on walking. Improvement slowly followed treatment by massage, warm douching, and dosage with strychnine, phosphorus, and arsenic. This man was at one time apparently in peril from respiratory difficulties. There was evidently some focal myelitis in the cervical portion of the cord.

My colleague, Dr. Lewis Jones, has given me particulars of a case in which wasting of the muscles of one buttock followed after an attack of influenza. Recovery ensued after treatment.

Disorders of the bladder may set in and persist

after an attack. Diabetes has been several times observed as a sequel.[1]

Arthritis and multiple synovitis sometimes follow influenza. At the outset of many cases, it is sometimes difficult to be sure that rheumatic fever is not in progress. There may be pains in the joints and pyrexia. The two disorders may even occur together and lead to a very grave condition owing to carditis. Cases have been carefully observed in which symptoms of myelitis, involving several tracts in the cord as well as the cornua, have led to arthritis or true spinal arthropathy. Dr. Sansom has directed attention to such cases, and has carefully studied them.[2] He has shown that there may be both affection of the cord and of the peripheral nerves in such instances. In a case he relates at length, there was polyarthritis, with symptoms pointing to disease of the antero-lateral columns, muscular spasms and contractions, motor paralysis and muscular wasting, also sensory changes, inco-ordination, and delayed transmission of thermic and other impressions. No pyrexia was present. The subject was a woman of

[1] Hennig, "Beiträge zur Symptomatologie und Therapie der nervosen Formen der Influenza," *Münch. Med. Woch.*, Sept. 3, 1895.

[2] *Clin. Journal*, Jan. 9, 1895, p. 165.

rheumatic proclivity, but Dr. Sansom found no ordinary symptoms of rheumatic fever. The illness began four months after a confinement and was clearly influenza, and many of the above symptoms were present on her admission to hospital. She left benefited, but returned in two months time with arthritis of the left knee, newly set up. This was six months after the attack of influenza. An almost perfect recovery from all the symptoms ensued, and this is an encouraging fact to note, since it relates to the prognosis of nearly all such grave conditions following influenza.

My colleague, Mr. Howard Marsh, has recorded several examples of arthritis of this nature.[1] He has found the hip-joint most often attacked. Synovitis first sets in, with stiffness and swelling. Muscular wasting soon follows. Severe sciatica occurred in one such case. There was fever, with a temperature of 102 degrees, in one case. The symptoms usually subside in two months' time. In one instance, the disorder followed six months, and in another seven months, after attacks of influenza. The conditions appear to simulate tuberculous disease of joints, but the prognosis is generally satisfactory.

[1] *Diseases of Joints*, 2nd edit. p. 30, 1895.

Mr. Jennings has recorded two cases in which influenza appeared to cause re-opening of old wounds in the skulls of miners which led to abscesses and fatal results.[1]

Were I to enter at length in laying before you an account of the sequels of influenza as set forth in the special literature on the subject during the last five years, the whole time allotted to me would not suffice for the purpose. I will therefore say "satis est quod sufficit."

Erysipelas.—Mental disturbance is rarely a sequel, but mania and delusions may occur on the subsidence of local symptoms. Recovery is the rule. Palatine and laryngeal abductor palsy followed one case complicated with pneumonia. The laryngeal paralysis necessitated tracheotomy, and was permanent.[2] Bradycardia has been noted.

Disappearance of chronic skin-diseases has sometimes occurred after an attack of erysipelas, such as eczema, or lupus; and sarcomata have also been similarly found to subside. Treatment for the latter has accordingly been practised of late by introducing cultivations of toxin from

[1] *Brit. Med. Journal*, June 8, 1895.

[2] Frith, *Berlin klin. Wochenschrift*, 1874, No. 49 (quoted by Gowers).

erysipelatous textures into the growths, so far, I believe, with no very satisfactory results.[1]

The tendency to recurrence of erysipelas, which has hitherto been explained by fresh infection with the specific poison, is now believed to be due to the survival of germs (Fehleisen's streptococcus) which have remained latent in the tissues, and are provoked into activity by the irritation of traumatism, or by exposure to undue heat or cold. Patients of gouty tendency were formerly believed to be especially liable to attacks of erysipelas, Caleb Parry, and James Gregory in particular, directed attention to this fact, but I am not prepared to confirm their statement so far as my own experience guides me. Traumatism, in any degree, predisposes to erysipelas, with or without breach of surface, in the former case by admitting specific germs, and in the latter, probably, by affording a *locus minoris resistentiæ*, wherein those that may be dormant in the system may become active and potential. Malignant endocarditis has been observed, though rarely, as a sequel, and streptococci have been found in the aqueous humour in a case of cyclitis following erysipelas.

Diphtheria.—The sequels of this disease are so

[1] Butlin, *Clin. Journal*, Jan. 29, 1896, p. 213.

remarkable, and, at times, so serious, that they have attracted close attention. I cannot discover evidence that these very obvious consequences were witnessed, or described, by the older physicians. But since diphtheria became endemic in this country in 1855, they have not failed to be noted, and recognised as depending upon the original malady.

The albuminuria, which is so common during the active state of the disease, usually passes off, leaving no trace of nephritis. But it may persist for two months subsequently. Dropsy is of very rare occurrence in this relation. Parenchymatous nephritis has been noted, but it is open to question whether the disorder thus complicated is not scarlatina rather than diphtheria, or perhaps a truly mixed infection. It is certainly very rare. The albuminuria is probably of toxic origin, and, so far, specific.

The gravest sequels are paralytic conditions, and the latest researches respecting them plainly indicate that they are due to a toxic neuritis, which may be widely spread. These paralyses occur in ten to twenty per cent. of all cases. They occur usually in from two to six weeks after the onset of diphtheria, and are commonly more marked in adults than in children. They may be

local or general. Of the former, we note palatal and pharyngeal palsies, strabismus, ptosis, ophthalmoplegia interna, and facial palsy. With some of these may be associated symptoms of general paresis or actual palsy. The general paralyses are of the same nature as the local, and are due to polyneuritis of toxic nature with loss of reflexes.[1] The vagus nerve is especially apt to suffer, and the evidence of this is afforded by great cardiac weakness, with bradycardia or trachycardia, or by fatal syncope. Vomiting may be troublesome, and may precede the cardiac symptoms. Loss of knee-jerk may sometimes be the only sign of nervous sequels. This is, however, always a symptom indicating gravity, and demanding vigilance in any case. The sphincters, as a rule, are unaffected. With due care in treatment, and an intelligent appreciation of the special dangers of such cases, the prognosis is on the whole good. Perfect recovery may be anticipated within three or four months. Fagge records a case in which signs of palatal palsy had remained for four years after diphtheria. Rarely, there may persist some enfeeblement of muscles in

[1] In one case, painful spastic cramps occurred in the arms, legs, and abdominal muscles for two days. Paresis of the legs followed, with loss of knee-jerks which persisted for ten months.

the limbs. I have a general impression, although unsupported by any figures in proof of it, that the nervous sequels of this disease have been somewhat less frequently met with since treatment by anti-toxin has been employed. We are fairly justified in anticipating that such may be the case. Recent researches of Sidney Martin and Kanthack plainly indicate that the diphtherial bacillary toxin induces a specific and spreading neuritis in animals, and hence we are justified in the assumption that a precisely similar process occurs in the human subject.

According to the observers just mentioned, the neuritis of diphtheria is primary, the sheath of Schwann being first attacked, and the axis-cylinder of the nerve subsequently. Kanthack has found the bacilli in the spleen and in the lungs. Dr. Pasteur has directed attention of late to the association of respiratory paralysis with cardio-pulmonary symptoms in diphtheritic multiple paralysis.[1] In a series of sixty-four cases of diphtheritic paralysis, serious cardio-pulmonary "crises" occurred in twenty, and in seventeen of these there was associated paralysis of the diaphragm. Most of them occurred between the ages of two and six years. Dr. Pasteur relates

[1] *Clin. Soc. Trans.*, vol. xxviii. p. 111, 1895.

the particulars of thirty-two cases in which the diaphragm and intercostal muscles were more or less involved, and gives an admirable and suggestive *résumé* of them. He makes a distinction between cases in which the disorder of the phrenic and intercostal nerves is peripheral, and those in which the phrenic nerves are involved centrally, or near to their nuclear (bulbar) origin. In the former, the diaphragmatic paralysis may develop insidiously and is altogether less grave; in the latter it may come on suddenly, in an acute crisis, with symptoms of dyspnœa and asphyxia; also with transient pyrexia and vomiting. Such cases are almost certainly fatal. Phrenic or intercostal palsy appears, according to Dr. Pasteur, to determine collapse of the adjacent portions of the lung, and especially of the base of the right lung.

As indicating the remarkable advance made in pathological and clinical study in quite recent times, I may recall here a passage taken from Sir Thomas Watson's classical lectures, to be found in the last edition, issued just twenty-five years ago.[1] He remarks: — "all these sequelæ are significant of blood-poisoning. We cannot suppose

[1] *Lectures on the Principles and Practice of Physic*, 5th edit. p. 895, 1871.

that the nervous symptoms, transient and wandering as they often are, can have their cause in any grave or material damage in the nervous centres. They denote, I presume, disturbed nutrition of the tissues from imperfect or altered conditions of the circulating blood." Watson was right in his belief that the nerve-centres were not involved, but the whole subject of neuritis in its many forms now constitutes a new chapter in medicine, one for which few materials existed in Watson's time, and those the careful observations of Chomel and of Graves, now sixty-eight years old, which might have, but somehow did not, set inquirers upon the track to discover peripheral neuritis.

As indicating how the supervention of a new infection may prepare the way for fresh outbursts of diphtherial disease, I may quote the case, recorded by Dr. Hayward, of a child, who, while recovering from diphtheria, was attacked with measles. On the invasion of the latter, there was a new activity of the lingering diphtherial bacilli with a re-formation of faucial membrane.

We have already noted how similar sequels may ensue when the vitality is lowered in cases of influenza, measles, varicella, and pertussis.

Disorders of the mucous membranes of the nose, and otitis are to be included amongst the occa-

sional sequels of diphtheria, also post-nasal adenoid growths. It is probable, if not certain, that some of the post-diphtherial sequels are due, as in other cases, to the results of mixed bacillary infections. The commonly associated broncho-pneumonia has been proved by Kanthack to be due to specific bacillary invasion of the lung. Malignant endocarditis is sometimes a sequel of diphtheria.

Malarial Fevers—The sequels of these present several problems upon which much light has been recently shed since the discovery of their intimate nature, and their dependence upon the several phases of the life of certain hæmatozoa or sporozoa.

We have the fact that, according to the degree of impregnation of the system by these parasitic bodies, there remains for long, sometimes for life, a tendency to recurrence of specific pyretic processes under certain provocations, and, not seldom, the establishment of what is well-known as malarial cachexia. A subject of the latter condition may resist all treatment, and die of anæmia or from hæmorrhage. The liver and spleen are commonly, but not always, enlarged. Paraplegia, sometimes spastic, has occasionally been noted. Intermittent paralyses, intermittent aphasia, cramps, hyperæsthesia, anæsthesia, articu-

lar pain and swellings, œdema, and urticaria, very specially, have been noted to follow malarial impregnation, all of these impressed with a periodic or intermittent character. These strange conditions we now explain by reference to the particular organs infested from time to time, and yielding manifestations of the development of the specific blood-parasite. Saccharine diabetes is sometimes distinctly traceable to previous malarious impregnation.

Neuralgia in various forms has been noted as a sequel, affecting intercostal, occipital, sciatic, and testicular branches. The supra-orbital branch of the fifth cranial nerve is especially liable to be thus involved, the condition being sometimes described as "brow ague."

We have to be careful in assigning to malarial influence any conditions of a periodic or intermittent character which may not certainly be connected with submission, at some time or other, to exposure to specific hæmatozoal infection. It is a character of all neuralgias to be paroxysmal and intermittent, even, as shown by Weir Mitchell, when of traumatic origin. But it appears certain that the effects of malarial impregnation may for many years induce a condition which modifies the course and characters of other

ailments. Thus, according to Fayrer, "periodicity complicates all diseases in India." A chill induced in any way may awaken activity of febrile symptoms many years after subjection to malarial influence. Neurasthenia and spasmodic asthma are amongst the Protean manifestations recognised in this relation, also intermittent torticollis, and a rebellious form of hiccough.

This peculiar latency of malarial influence has now to be considered with reference to the modern doctrines held as to the nature of the disease. It is believed that the malarial germs are not absolutely destroyed, but only rendered impotent or latent by drugs held in repute for cure, such as quinine and arsenic. Improved general health of the patient appears to render the hæmatozoa latent for a time. New forms of illness may induce fresh activity of the hitherto latent germs. According to Manson, the causes of latency are various even for the same micro-organism. It has been proved that individuals may become immunized to the toxins of bacilli, although the microbes may continue to exist and grow. The latter may thus apparently remain latent or dormant, englobed in cells, or prevented by a barrier of cells from gaining access to the body (Washbourn).

In malarial infection, there is often evidence of the presence of varieties of hæmatozoa, an admixture of parasites, each of which may cause varying types of fever. Quinine has more power in destroying some of these than others. It appears certain that some of these bodies undergo development in various organs of the body, especially the liver, spleen, intestinal mucous membrane, brain, and bone-marrow. Many of the symptoms appear to depend upon the organ selected for their accumulation and sporulation. The blood is most impregnated at the beginning of a paroxysm of fever, and least so in the apyretic intervals. As Manson has pointed out, the principal acts in the drama in pernicious cases are played out in the viscera, whence, at intervals, swarms of parasites are embolically shed into the circulation, producing the varied symptoms of malarial pyrexia.

We may account for the lingering tendency to recurrence of paroxysms by supposing that the specific hæmatozoa in a given case have never been quite annihilated, but have remained latent or quiescent, locked up, as it were, in some viscus or tissues of the body, and only set free by the onset of some general disturbance which lowers the vitality and resistance of the patient.

I think we may fairly anticipate that some absolute proof in support of this conception will be presented to us before the lapse of many years.

Dengue may be followed by troublesome enlargement of the lympharia for many weeks after the illness, and the same mental and physical prostration may long remain after an attack, as is witnessed after influenza.

Epidemic Cerebro-spinal Meningitis may have for sequels persistent vomiting, and sometimes a spinal arthropathy, even purulent arthritis. Optic neuritis with atrophy and blindness, has been noted, also otitis interna with deafness, leading in children to deaf-mutism. Headache may persist for months or years. Chronic hydrocephalus, imbecility, and aphasia may occur. Peripheral neuritis of some of the cranial or spinal nerves has also been observed.

Several sequels are recognised as results of *Dysentery*. A form of arthritis sometimes sets in, perhaps a month after recovery, rheumatoid but not rheumatic, possibly akin to gonorrhœal or infective arthritis. Several joints are commonly

involved, but there is not much pain. These disorders generally pass away within a few weeks or months, and have been observed to supervene in milder rather than in severer cases of dysentery. The swelling may be very great. No sweating or cardiac complications have been noted, and the degree of pyrexia is usually mild. Chronic nephritis may follow an attack of dysentery. Neuritis leading to paraplegia has been noted. Chronic dyspepsia, irritability of the bowels, and a cachectic condition, with wasting and anæmia, may ensue after severe and repeated attacks. This state is doubtless due to destruction of large tracts of the mucous coat of the colon, which are replaced by scar-tissue of no functional activity.

Cholera.—Convalescence is sometimes protracted. Anæmia may long remain, and the menstrual functions may cease for many months. Tetany may affect all the limbs, may spread to the trunk and involve the glottis, causing suffocation. Phlegmonous furunculosis, sometimes ending in gangrene, may supervene, and this condition has been found associated with glycosuria. This is not improbably due to secondary infection from the intestinal surface. Dyspepsia and rebellious diarrhœa may persist after an

attack. Bronchitis, pleurisy, pneumonia, suppurative parotitis, gangrene of the extremities, and ulceration of the cornea have all been noted, also diphtheritic inflammation of the fauces and genitalia. Paralytic sequels have been met with, also mental disturbance. One attack is not prophylactic against a second one.

Oriental or Bubonic Plague.—Some sequels have been noted in patients who have suffered and recovered from this specific and most contagious disease. Pericarditis, furuncles, dropsy, partial paralyses, and mental disturbances are amongst the most frequent. The fact that Kitasato's bacillus has been found in the blood-glands and viscera affords an explanation of such consequences, and leads to the belief that they depend, like those of enteric and some other fevers, upon toxic residues, with, possibly, additional and fresh (mixed) infections of other, though non-specific, microbic elements.

LECTURE III

Syphilis.—The sequels of syphilis are now amongst the best-recognised disorders we have to deal with. Their variety, complexity, and far-reaching nature are well appreciated. Much light has been thrown upon them in the course of the last thirty years, and many labourers have worked in this field of pathology, not a few of whom have been our own countrymen. We may feel sure that a great variety of disorders depending on manifestations of syphilitic virus constituted difficult problems for solution to our predecessors, and no less enabled many of them to score remarkable successes in the days when mercurial treatment was so largely, and in an empirical, routine fashion, in vogue. For the most part, it may be affirmed that the sequels of syphilis pertain to adult and middle life. I am reminded here of an axiomatic declaration of the older physicians, related to me by our learned librarian, Dr. Munk, to the effect that many of the

mysterious and puzzling cases of disease occurring in early life generally depend upon tuberculous processes; those commonest in middle life upon syphilis; while those occurring in later periods are generally dependent upon gouty manifestations. In these days, we do well to recall the wisdom and shrewdness of the great men who have preceded us; for we are rather apt to think that we have lighted our own torches, and to regard those handed on to us as but feeble and flickering links. Our modern electric illumination sometimes fails us, and we may then be glad to fall back upon the older sources of light.

We have to note as sequels some of the so-called secondary phases of syphilis, and may not regard in this light only such symptoms as arise after a period of apparent complete restoration to health in the form of late or so-called tertiary manifestations. These appear from one to two years after primary contagion, and may recur any time within the life of the patient. Yet we can draw no hard-and-fast line between the end of the period in which secondary and that in which tertiary troubles may arise. Attention has recently been directed to the onset of grave nervous symptoms, such as paraplegia, from transverse dorsal myelitis, general analgesia,

anæsthesia, and acute multiple neuritis in patients at an early period after primary infection, at a time, that is, when secondary manifestations are most likely to occur.

So, too, neuritis, affecting single nerves, may be an early occurrence.

Syphilis, as a destroyer of arteries, may act in this fashion, with the production of grave symptoms within the first year of primary infection, at a period when only secondary manifestations are to be expected. Dr. Sharkey has recorded a case in which death occurred from disease of the cerebral arteries in the seventh month of syphilis, when a secondary eruption was still present on the body. Dr. Bristowe recorded a like case, in which death occurred from obstructive endarteritis, cerebral softening, and meningitis six months after the occurrence of the primary chancre, while secondary scaly syphilides were still present on the skin.

The importance of a due recognition of these facts is great in respect of prompt and adequate treatment, since early lesions of this character are distinctly more amenable to the influence of mercury than are those which arise in the later or tertiary stage, and are prone to begin slowly, and to prove rebellious under any treatment.

These early sequels, pertaining to the secondary

or constitutionally active period of the disease, are apt to develop rapidly, with serious disturbance of the general health. They are often productive of symmetrical lesions, and quickly subside on appropriate treatment. We may not look for them, as Mr. Hutchinson tells us, within six months of the date of the primary lesion. Most of them relate to the arteries of the pia mater of the brain and spinal cord, and in this way lead to nervous symptoms. The nervous elements may, however, be primarily involved in this stage, as evidenced by the occurrence of neuritis and myelitis, with both motor and sensory symptoms. In this secondary stage the blood and inflammatory secretions of the patient are infective and capable of originating a chancre.

The later or tertiary sequels occur without constitutional disturbance, slowly, generally unsymmetrically, and are more distinctly local in character. The patient's blood and secretions are non-infective in this stage.[1]

Mr. Hutchinson is disposed to regard all tertiary symptoms of syphilis as true sequels, or,

[1] For many of these statements I am indebted to Mr. Hutchinson's address before the Roy. Med. Chir. Society introductory to a discussion on Affections of the Nervous System occurring in the early (secondary) stage of Syphilis, 1895.

more strictly, "regrowths." In support of this view, he and other authorities adduce evidence showing that persons have become the fathers of families of healthy children, and have subsequently developed tertiary lesions. In such cases there must have been freedom from constitutional taint, although local conditions remained in a condition of latency or abeyance, ready to be evoked by some determining excitant.

It would be unseemly and unnecessary in these lectures to present to my audience any detailed account of the manifold tertiary symptoms of syphilis, regarded as sequels, such being now matters of common knowledge. We are happily aware of the fact that in the majority of cases of primary syphilis, prompt, adequate, and sustained treatment suffices practically to cure the disease, and to avert the onset of sequels throughout life, and so we may fairly regard their occurrence as evidence either of imperfect original diagnosis, or of incomplete treatment. The pathogenic conception of the malady as one dependent on a specific micro-organism helps us in forming an opinion, judging by analogy with the behaviour of other like organisms, that such particulate agents may long lie dormant in certain tissues, and only wake up into activity under various

provocations, such as irritation, exposure to exhausting agencies, depressed vitality from the inroad of other diseases, and traumatism.

The unsymmetrical character of these consequent lesions affords some evidence of their local and non-constitutional nature. I have already referred to the occurrence of tabes dorsalis as a definite sequel in most instances of antecedent syphilitic infection, and I may add, too, that of general paralysis of the insane as one standing often in the same category. Syphilis does not appear to be an antecedent of disseminated cerebro-spinal sclerosis, but syphiloma in the cerebral meninges may induce symptoms somewhat resembling those characteristic of the former lesions.

In my first lecture I adduced the fact that when women presented the symptoms of locomotor ataxia, they were commonly found to have been at one time the subjects of constitutional syphilis. I regarded this fact as affording strong evidence of the former disorder being in consequential relation to the latter, as, in short, a quaternary sequel of syphilis. This contention is, I consider, still further supported by the occurrence of examples of tabes dorsalis in both husband and wife. My colleague, Dr. Ormerod, has reported two examples illustrating this condition, and he

has referred me to a series of four or five other pairs of cases which have been recorded in this country, on the Continent, and in Canada; also to cases of pairs of general paralysis of the insane, nearly all of which distinctly prove that syphilis was the common antecedent factor. I therefore regard this evidence as irresistible, and practically proving the case.[1] In some of these instances the husband had tabes, and the wife general paralysis, or *vice versâ*.[2]

Even tabes dorsalis has its own intercurrent sequels, amongst them being the peculiar acute onset of a riotous arthritis known as Charcot's arthropathy, which may affect several joints;

[1] *St. Barthol. Hosp. Reports*, vol. xxv. p. 87, 1889. Dr. Ormerod's references are as follows: Dawson Turner, *Lancet*, Nov. 1, 1890; Goldflam, *Neurolog. Centralblatt*, 1892, p. 445; Mendel, *ibid.*, 1895, p. 335; Reed, Montreal, a pair of cases seen in private (reported to Dr. Ormerod); S. Pearce, *Journ. of Nervous and Mental Diseases*, 1895, p. 8; Erb, *Ætiologie der Tabes*, 1892. In recently analysing 200 cases of tabes occurring in men of the upper classes, Erb found evidence of past syphilis in all but four of them.

[2] Westphal has recorded a case in which a woman, æt. 38, whose husband had suffered from tabes dorsalis, and who herself had had symptoms of general paralysis for a year. She then suffered from Charcot's arthropathy of the right foot, atrophy of the jaw, and loss of teeth, with absence of right knee-jerk. Later, there followed similar changes in the left foot, and a deep perforating ulcer of the great toe.—*Charité-Annalen*, 1895.

also perforating ulcer of the foot, and the several varieties of *crises*, whether gastric, laryngeal, rectal, or vesical.

We may note several degrees of gravity in the cachexia of inherited syphilis. There are often to be noted indications of a merely slight taint, such as anæmia, earthy complexion, and perhaps one or two characteristically modified teeth. General growth may be but little interfered with. In the graver cases we have usually present many, if not all, of the specific physiognomical indications, and in viable cases, full development of the body is never reached.

It is important to recognise even the minor indications of such taint, inasmuch as they may serve to throw light upon subsequently occurring obscure symptoms, and so afford a guide to treatment. Twelve years ago Mr. Hutchinson expressed the opinion that it is not the diathesis of syphilis that is transmitted from parent to offspring, but the germs of the disease itself—the particulate elements of the virus;[1] a transference, therefore, of contagion rather than hereditary transmission. "A child inherits syphilis in precisely the same sense, and in precisely the same manner, as it may inherit small-pox." He

[1] *The Pedigree of Disease*, p. 89, 1884.

believes that "no minimised transmission of syphilis is possible." The child gets either nothing at all, or the germs of the disease; and in the latter case they will, subject to the laws of idiosyncrasy, develop equally in all cases. The minor indications of this specific taint I have alluded to may be amongst those which have not been permitted to develop fully owing to some inhibitory condition.

Paralytic dementia, ophthalmoplegia, a variety of epilepsy, grave arterial atheroma, and general arterial sclerosis are certainly due, sometimes, to pre-existing syphilitic taint. These conditions have been called by Fournier para-syphilitic affections, by some post-tertiary or quaternary. Lardaceous degeneration may sometimes be clearly traced to previous syphilis, not merely as an associated condition with gummata and a resulting fibrosis, as in ordinary tertiary sequels, but as an independent and widely spread degeneration, both of viscera and of other portions of the frame, constituting, indeed, a variety of so-called syphilitic cachexia. Congenital syphilis may sometimes be followed by manifestations of Raynaud's disease with gangrene of the fingers and toes. I have seen several examples.

The conception in regard to these conditions is that the remote lesions are not directly due

to syphilitic toxin, or to growths determined by it, but that a constitution having been once tainted by this special virus becomes a prey to other specific degenerative changes, which would, in all probability, not have occurred in persons not subjected to such an ordeal.

With several authorities I am in accord in regarding the occurrence of aneurysm as, not infrequently, a sequel of syphilis, and this contention is strengthened by the fact that when this condition occurs in women, which is rare, they have commonly been the victims of syphilis. The same view is also tenable, in my opinion, in respect of cardiac aneurysm, which is usually a result of gummatous carditis. Syphilis appears to hasten concurrent tuberculous processes.

The latest researches on syphilis support the view of Paget and others, that the long-delayed manifestations of it plainly indicate that there remain in the tissues of the body residues of the disease after apparent recovery, and that these may be roused into activity, affording specific characters of their own, or modifying the signs of other morbid conditions with which they may be associated or combined, such as gout and struma. Examples of this latency pertain, indeed, to each phase of syphilis. Thus, there may be remarkable

delay in the formation of a hard chancre after primary infection. An indolent bubo has been known to precede the occurrence of a penal induration by seven weeks, according to J. Hutchinson, junior. Secondary symptoms followed in due course with a more active condition of the bubo. A period of ten weeks was noted by Aimé Martin in another case before the occurrence of a hard chancre.[1]

Delay in the onset of secondary symptoms has also been carefully noted. M. Diday's observations show, and Mr. Hutchinson confirms them, that intercurrent illnesses may cause such postponement. Thus, typhoid fever and pneumonia have been proved to cause postponement of secondary symptoms for periods varying from three to over five months, the activity of the specific virus being suspended till recovery from these illnesses had taken place. These facts are very remarkable. Mr. Hutchinson, junior, has recorded an example of extraordinary prolonged latency in respect of tertiary manifestations. A man contracted syphilis at the age of twenty-one years, had secondary symptoms, and remained wholly free from any lesions till, after exposure to much privation, he had, at the age of fifty-three years, multiple nodes on the skull, ischium, and humerus.

[1] *Lancet*, p. 1576, Dec. 21, 1895.

For thirty-two years, therefore, there had remained potential elements within the body ready to resume activity on due provocation. The only analogous condition to this is that presented by the strange behaviour of the malarial organism, which has a similar propensity to lie long dormant, or latent, within the body. According to Gowers,[1] "It is seldom that a syphilitic process develops thirty years after the malady, whether it be a direct or indirect process. . . . . A period of thirty years after the primary disease brings most patients into the degenerative period of life . . . . but the syphilitic virus has then generally ceased to act."

It is highly probable, but not yet proved, that the infective microbes, if such they be, or, possibly their germs, are present in tertiary deposits, and completely localised there, though not always inactive. Some arguments in favour of this view have lately been adduced by my former house-physician, Dr. Parkes Weber, in two able papers on the subject of Syphilis, published in the *American Journal of the Medical Sciences*. He further expresses his belief that in the post-tertiary, or quaternary sequels, such as tabes dorsalis, microbes will not be found, and that thus

[1] Lecture on "Adult Anterior Poliomyelitis, *Clin. Journ.*, Feb. 12, 1896, p. 41.

there is a clear demarcation between tertiary and quaternary lesions. He is also of opinion that the metabolic products of the specific organisms have, like those of the staphylococcus pyogenes aureus, and the bacillus pyocyaneus, the peculiar property of inducing lardaceous formation in their immediate neighbourhood.[1]

The presumed localisation and latency, or comparative latency, of surviving microbic germs appears adequate to explain the fact that persons so infected may long continue to produce healthy children, for our latest conceptions of syphilis lead us to regard the various active processes which it induces as the results of the presence of developed organisms, circulating abundantly in the blood in the secondary, exanthematous stage, and leaving behind it germs localised in various textures which are inoperative till some exciting cause sets up their development, with new tissue-growths and other tertiary manifestations in the later stages.[2]

[1] *Op. cit.*, Nov. 1885.

[2] It is strange indeed to find that while, on the one hand, we rejoice in the triumphs of modern preventive medicine, and look forward to the time when most of the specific and infectious diseases will, like typhus and relapsing fever, disappear, on the other hand, as a nation, we treat as of no consequence the ravages and sequels of syphilis throughout our Empire; that we deliberately, in the face of accurate knowledge, in defiance of common-sense and prudence, but solely in deference

The same arguments appear to me to apply in the case of relapses of *Rheumatic Fever*. These may be explained, perhaps, by renewed bacillary activity, new generations occurring owing to inadequate or insufficiently prolonged specific treatment, or else to premature dieting with improper pabula, which favour the developmental activity of the hypothecated infecting organism.

Pyæmia.—There are sometimes to be met with cases of chronic arthritis or of articular deformities, with ankylosis, which have developed from an attack of pyæmic arthritis, which may have occurred perhaps many years previously. Malignant endocarditis is sometimes a sequel of pyæmia.

Having now described the various sequels which are recognised in the train of the great class of acute and infectious diseases, the greater part of my task is accomplished, for not many others than these can be affirmed to have true sequels.

Taking the whole class of *Nervous Diseases*, we can find but few remote consequences which can

to an absurd sentimentalism which rests on nothing but ignorance, smugly attired, indeed, and masquerading in the name of Christianity, allow the populations of to-day, and, alas! of the distant future, to be devitalised and largely decimated by this pest. In my opinion, much of this folly is due to our passive acquiescence in it, and it will continue to lie at our doors till the Physicians and Surgeons of England speak out with a voice that cannot be misunderstood or silenced.

fairly be regarded in the light of sequels. Imperfect recovery may lead to recurrence, and the onset of new symptoms for the most part betokens further progress in any such morbid process, strange and unconnected with the original disorder as they may appear to be.[1]

The sequels of chorea commonly depend on renewed activity of rheumatic processes in other parts of the body, and relapses are frequent. Caleb Parry stated that the worst case of spasmodic wry-neck he ever met with followed chorea. This must be a very rare sequel.[2]

We may note the onset of a form of riotous arthritis as a sequel sometimes in cases of syringomyelia, a condition singularly akin to the arthropathy described first by Charcot in cases of tabes dorsalis.[3]

Sufferers from megrim and chronic headache, especially females, are sometimes in middle life and later the subjects of xanthelasma in the eyelids. A happy and frequent sequel of hemicrania

[1] *Vide Remote Consequences of Injuries of Nerves*, John K. Mitchell, M.D., Philadelphia, 1895. A practical and important treatise.

[2] *Elements of Pathology and Therapeutics*, vol. i. p. 258, 1825, 2nd edit.

[3] *Diseases of the Joints, &c.*, (Howard Marsh). Account of this affection by J. H. Targett, 1895.

is an immunity from it after middle life, so that sufferers cease to be its victims, even when subjected to conditions which formerly, and unfailingly, provoked it.

Certain varieties of Zona have sequels, some of which are not unimportant. Supra-orbital zona may, especially if the nasal branch of the nerve be involved, lead to ulceration of the cornea, iritis, photophobia, conjunctivitis, partial ptosis of eyelid (involvement of third nerve), defective vision temporarily, or even permanently, with papillary atrophy.[1] Troublesome neuralgia may ensue. This variety of zona is further remarkable for leaving indelible scars behind it. Necrosis of the alveolar part of the lower jaw, with loss of several teeth, was noted by Paget as a sequel of infra-maxillary zona.[2] Sir Thomas Watson's cases are noteworthy; in one, a patient who had been annoyed with continual noises in his head for seven years, become free from them for eighteen months subsequently to an attack of zona of the scalp; in another, a chronic teasing cough disappeared on the supervention of zona.

[1] *Vide* J. Hutchinson, *Ophth. Hosp. Reports*, part iii. vol. v.; J. Bowater Vernon, *St. Barth. Hosp. Reports*, vol. iv. p. 121, 1868.

[2] *Brit. Med. Journ.*, 1866, p. 492.

The worst sequel is that of terrible and rebellious neuralgia, which more especially plagues elderly subjects who have suffered from zona. This may last for months, or even for ten or fourteen years, as in cases described by Trousseau[1] and Watson.[2]

Injuries to nerves may be followed by vesicular and bullous eruptions and by glossy condition of skin. Disease of the Gasserian ganglion and injury to the fifth nerve may induce sloughing of the cornea. Acute bedsore may rapidly supervene on myelitis.

The sites of former zonal eruptions may subsequently become anæsthetic, hyperæsthetic, or pruritic. Pigment may also be removed from adjacent areas of the integument. An attack of herpes limited to the foot has been reported as following a twist of the ankle joint.[3]

As bearing on the subject of neuro-trophic lesions and sequels, I may refer to two cases, within my knowledge, where the hair from every part of the body was permanently lost in two male

[1] *Clin. Med.*

[2] *Op. cit.* The late Sir Robert Christison, my former revered preceptor in Edinburgh, suffered from this condition at an advanced age. He told me he secured more relief from his sufferings by brisk walking-exercise than by any other measures.

[3] *Med. Chronicle*, March 1893, p. 366 (quoted by Malcolm Morris).

adults after injury to the head caused by violent concussion.[1] Permanent anosmia is also sometimes a sequel of this accident.

Not many sequels are recognised after the occurrence of *Diseases of the Respiratory System.* An attack of pneumonia sometimes appears to predispose patients to subsequent attacks. Bronchitis sometimes evokes attacks of spasmodic asthma, which might possibly never have supervened but for the original disorder.

We may regard the fatty and lardaceous change in the liver following on pulmonary tuberculosis as varieties of sequels or consequential degenerations, the latter change ensuing more especially upon prolonged purulent discharge from vomicæ. Neglected and inadequately treated empyemata commonly lead to this condition. Lardaceous change is certainly less frequently met with now than formerly, probably because suppuration is better controlled by modern surgical methods of treatment. We may note the occurrence of rheumatoid affections and of cerebral abscess as pyæmic sequels to bronchiectasis, a condition now also better understood and treated

[1] One of these is recorded in my Paper on "Nature and Treatment of Porrigo Decalvans," in vol. viii. of *St. Barth. Hosp. Reports*, 1872, p. 159.

than formerly. We should hardly be justified in regarding fatal hæmoptysis in cases of chronic phthisis, due to aneurysm of a branch of the pulmonary artery as a true sequel, nor the occurrence of tuberculosis as an apparent outcome of an attack of pneumonia. We should have to prove that the original process was not a tuberculous invasion. We may, however, certainly regard as a sequel the occurrence of neuralgia of branches of the fifth nerve supervening on severe attacks of coryza.

Respecting pleurisy, whether dry, or with more or less effusion, we may still seek to discover whether, when it arises on the right side, it is more commonly the precursor, if not the first step in the progress, of pulmonary tuberculosis. Left-sided pleurisies appear to be more commonly benign in character. This is an old doctrine of the French school, and was taught at Edinburgh in my time, and I think there is something to be said in support of it.

Many cases presenting strumous adenoma are void of tuberculous symptoms in after-life. Others develop pulmonary tuberculosis, or in advancing years, under the stress of acute illnesses, become the subjects of new and revealing developments of senile scrofula.

Amongst the sequels of chronic nasal catarrh, and often aggravating the condition, are post-nasal adenomata, polypi, and enlargement of the tonsils.

Pneumonia may sometimes have a very untoward sequel in the form of pneumococcal endocarditis, with a fatal issue therefrom. A case of this kind occurred lately in the practice of my colleague Dr. Church, and death occurred with a sudden onset of anginal symptoms, owing to plugging of the coronary artery by the new growth from one of the aortic valves.

Osler has found that pneumonia is an antecedent of malignant endocarditis in twenty-five per cent. of all cases of that disease.[1] Disseminated cerebro-spinal sclerosis has also been known to follow in the train of pneumonia.

Nothing very definite can be affirmed respecting consequences of *Diseases of the Heart and Blood-vessels*, which may not rightly be regarded as evolutionary manifestations to be expected in accordance with our modern knowledge of them. We may note the fact that the subjects of congenital cardiac malformation, even when viable beyond the period of puberty, never attain mature growth,

[1] This experience is not, however, confirmed to this extent by British observers.

and are bad subjects for the exanthemata, especially for the invasion of scarlatinal poison, and are often prone to be tuberculous. A similar stunting of growth pertains to almost all subjects of endocarditis, with valvular disease, attacked before puberty. Osler remarks that death is due in many cases of congenital heart-disease to abscess of the brain. This fact, so far as I am aware, has never been verified in our experience at St. Bartholomew's Hospital. Within the last few weeks, however, a case proved fatal under the care of my colleague, Dr. Church, in which suppurative meningitis occurred. There was no ear-disease. There was stenosis by fusion of the three segments of the pulmonary valves, leaving an aperture admitting a swan's quill, and the septum of the ventricles was deficient in the usual situation at the undefended space. The patient was a fairly well-developed girl of sixteen. There was much cyanosis. Headache, several general convulsions, and bilious vomiting occurred for a week before death. The temperature never exceeded 100·6°. The relation between the cardiac condition and meningitis, or cerebral abscess, I am quite unable to explain in such cases, and I know of no other author than Osler who mentions the fact of such a connection.[1]

[1] *Prin. and Pract. of Medicine*, 2nd edit., 1895.

Insanity sometimes supervenes in cases of aortic and mitral valvular diseases during the stage of compensation, and has been known to lead to suicide.

Ear-Diseases have sequels which are only too common, but now well-recognised. I have incidentally alluded to such as occur after the acute infectious fevers. Suppurative meningitis, cerebral or cerebellar abscess, necrosis of the petrous part of the temporal bone and infective thrombosis of the lateral sinus and internal jugular vein, are the chief consequences. And a general pyæmia is not seldom a result, direct infective particles being readily conveyed to the lungs to set up multiple and still further purulent and septic foci of the disease. Prompt surgical measures now, happily, avert many of these terrible sequels. We have further to bear in mind the possibility of otitis media in many patients presenting cerebral symptoms, who have no ordinary indications of ear-disease as the primary source of this malady.

Respecting sequels of *Gout*, I have nothing to note. The many and varied disorders occurring in persons goutily disposed are often distinctly gouty. The several visceral and tissue-degenerations observed in grave cases are evolutional manifestations of this disorder. Traumatism, shocks, bodily or mental, or operative procedures, may all give rise

to outbursts of gout in predisposed subjects, and are thus provocative of this revealing symptom.

I may refer to the fact that adenoid growths in the naso-pharynx sometimes lead to subsequent tuberculosis, impaired mental functions (aprosexia of Guye), disease of the ear, and to stunted growth of the body. With the activity of modern surgery, which nowadays seldom permits these new growths to induce any of these evil conditions, we may perhaps find such sequels of less frequent occurrence in the future. I might add my opinion that operative interference in these cases is not always imperatively necessary.

Such sequels as occur in patients who have been subjected to ovariotomy relate rather to physiological than to pathological manifestations. An obese tendency is common, with vocalisation approaching that of the male, growth of hair on the upper lip and chin, or over the entire body, loss of general energy, tendency to indulge in stimulants, and proneness to gout, have been noted. This is interesting when considered with the commonly asserted statement that eunuchs do not suffer from gout. To these may be added the onset of symptoms of a premature menopause, with flushings, chills, and profuse sweatings. The spleen may, as Mr. Knowsley Thornton informs

me, become temporarily enlarged a few months after ovariotomy. He has observed the occurrence of pains in joints, tendons, and fasciæ, but these have subsided generally within a year or two, but he believes any other changes to be exceedingly rare.

Amongst *Diseases of the Skin*, we may observe the tendency of some scars to become the seats of Alibert's keloid. Long-persisting local irritation may eventuate in the formation of fatty and fibro-fatty tumours, and predispose to malignant growths. Sebaceous tumours of the scalp may become malignant, and induce secondary growths all over the body. Psoriasis may pass into lichen ruber. Chronic tinea capitis may lead to patches of area, which, so far as I regard the latter, are neurotrophic, and non-parasitic. General dermatitis may supervene on ringworm. Dr. Abraham had an example of this kind under his care. Erythema appeared over the trunk, desquamation of the palms and soles followed, and the skin assumed a xerodermia-like condition with furfuraceous scaliness. Anthrax has sometimes been followed by malignant endocarditis.

It is still undetermined whether acro-sclerodermia is a true sequel in cases of Raynaud's disease. The association of the two conditions is certain.

If we enlarge, as I think we should do, our conception of the state known as Raynaud's disease or local asphyxia, I think it is permissible to believe that such cases may sometimes eventuate in a condition of wide-spread sclerodermia with telangiectases and acro-sphacelus. I have now under observation, in private, a grave example illustrating these changes.

Lupus may sometimes become the seat of epithelioma; and the inflammatory lupoid ulcerations met with in Kaposi's disease (xerodermia pigmentosa) may also produce cancer. It is not yet determined whether the condition of skin, known as Paget's disease of the nipple, scrotum, and penis, is a benign form of eczematoid irritation due to psorospermial infection, leading ultimately to cancer, or whether it be, as held by Thin, a cancerous disorder throughout.

In most cases of mycosis fungoides there is also a long preliminary stage of eczematoid disease, not seldom mistaken for chronic eczema, urticaria, or erythema, which is followed months, or even years, afterwards by the special fungating lesions. Sometimes, the latter appear without any superficial dermatitis. It is not without interest to know that an attack of erysipelas is alleged to have cured one case of this intractable and slowly

fatal disease. A variety of xanthoma, temporary in character, is occasionally met with in the course of chronic glycosuria, probably due to irritation either from glucose or some ill-metabolised matters in the circulation.

Urticaria may follow the operation of tapping hydatid tumours of the abdomen.

The consequences of specific *Gonorrhœal* infection are well-known in the form of ophthalmia, often incoercible arthritis, especially in those of a gouty habit of body, and in flat-foot. The toxin generated by the gonococcus may sometimes prove very virulent. Whether it be generated directly by this organism, or, as in the case of diphtheritic bacilli, as shown by Sidney Martin, it arises from a chemical substance of the nature of a ferment, which acts upon albumoses in the body, and converts them into a toxin, is not yet ascertained; but it has been suggested by Gowers that this may in some cases alight upon the nervous structures as it does in others upon joints, and so set up a rapidly spreading myelitis, which has sometimes proved a fatal sequel of gonorrhœa. Gowers has described a case of this kind, which ensued three weeks after primary infection, and one week after convalescence. The patient was an overworked youth of 19 years of age. Gonorrhœa in

youth appears to predispose to urethral stricture at a period of life when prostatic changes set in. Dr. Hale White has recorded two cases in which malignant endocarditis resulted from gonorrhœal virus, the pulmonary valves being affected in each instance.[1] Pericarditis, pleurisy, and peritonitis are also amongst recognised sequels, and gonococci have been found in the pus of gonorrhœal ophthalmia, and may probably be discoverable as the cause of the iritis which is often associated with it.

In women, ovaritis and chronic pyosalpinx may follow after gonorrhœa.

Obesity is sometimes a sequel of acute illnesses, and is especially frequent after enteric fever and pneumonia. Anæmia, hæmorrhagic or otherwise, may also be followed by obesity, and the same condition has been observed to develop after courses of mercury.

There are no very noteworthy sequels in the train of *Diseases of the Alimentary System;* none, that is, in the sense in which I have considered them in these lectures. Most consequences of these disorders relate to renewed attacks, or are of the nature of complications and direct extension of morbid processes. I may mention the occurrence

[1] *Lancet*, Feb. 29, 1896, p. 534.

of tetany as sometimes following on cases of gastrectasia, especially after the stomach has been washed out (Kussmaul). In cases of chronic indigestion in young children, described as the "cœliac affection," or diarrhœa alba, by Gee,[1] when recovery is slow, there is apt to remain a frail condition of health, with stunting of growth and a weakness in the limbs, the child being unable to jump. Leucoma, psoriasis, syphilitic ulcers, and all varieties of irritation of the tongue are amongst recognised conditions which may eventuate in the sequel of carcinoma at some later date. *Gastro-intestinal catarrh* has been observed in one case to be followed by paresis of the lower extremities, according to M. Potain, and the same authority has described a case of secondary spinal paralysis, which followed chronic diarrhœa. Right hemiplegia, with anæsthesia, has been also noted in the course of gastro-intestinal catarrh.

It is not improbable that some febrile disorders, as yet not differentiated, may arise from absorption into the system of toxalbumens from the alimentary canal. Mr. Macnamara has suggested that septic products due to many carious teeth may thus sometimes exert pernicious effects, including some forms of painful arthritis; and it

[1] *St. Barth. Hosp. Reports*, vol. xxiv. p. 17, 1888.

is highly probable that adenitis and other disorders may result from infections originating in foul conditions of the teeth and gums, due to neglect, which have hitherto been too little considered in this relation.[1]

Hepatic Diseases.—The vagaries of, and symptoms set up by, gall-stones are fully appreciated, and lead to many and strange sequels—biliary fistulæ, pyrexia, catarrhal cholangitis, and intestinal obstruction, amongst many others. Some of the most difficult diagnostic problems, clinical mysteries, come to be solved by the presence, somewhere, of biliary calculi. In a considerable number of cases carcinoma is the outcome of their continued irritation, arising in the gall-bladder or gall-ducts, and gradually invading the liver-texture, and even spreading to the abdominal lymphatics, the lungs, peritoneum, and omentum.[2] Biliary calculi being more frequently present in women, this grave sequel is rather more common in them. Norman Moore met with ten examples of cancer of the gall-bladder and large bile-ducts, five in each sex, all of carcinoma. Gall-stones were present in four, and a calcified hydatid cyst in

[1] "Oral Hygiene," by William Hern, M.R.C.S., *Journ. Brit. Dental Association*, p. 159, March 16, 1896.

[2] *Vide* Kelynack, *Practitioner*, April 1896, p. 387.

one.[1] The occurrence of xanthoma may be mentioned as an occasional sequel of chronic jaundice.

In several cases of *Hepatic Abscess*, I have known the patient to suffer from recurring pain in the region of the liver, evidently due to adhesions. This has been severe enough to arouse fear of a fresh abscess. In one case, an officer could never comfortably bear the weight of his sword when doing duty on his horse. In another case, death occurred within two years from adhesions set up to the stomach and adjacent parts, the original abscess, a very large one, having long been healed. No operative measures would have been of any avail.

Diabetes mellitus cannot be said to have any sequels, properly so-called. The conditions of Glycosuria as a manifestation of goutiness, the result of faulty metabolism in intestinal digestion, or of hepatic inadequacy, is one which induces a general faulty nutrition, and a vulnerability of the tissues of the body, which may expose the patient to special dangers under the stress of acute diseases, or render him especially liable to tuberculosis, boils, carbuncles, and gangrene. A saccharine impregnation of the blood appears to render that fluid a better medium for the cultivation of microbes.

[1] Bradshaw Lecture, Roy. Coll. Phys. 1889.

Animal parasites may lead to several untoward sequels. Thus, the blood-flukes—Bilharzia hæmatobia—as a cause of endemic hæmaturia, may form nuclei for the formation of vesical calculi, and also induce a form of dysentery. Distomata, or liver-flukes, may lead to cholangitis, hepatic enlargement, jaundice, and ascites. Lumbrici may pass into the larynx or trachea, causing suffocation, or gangrene of the lung, or they may enter the common and also the smaller bile-ducts. The bowel may be perforated by them, and peritonitis result. Trichiniasis when recovered from, in the first stage, may leave behind it great muscular weakness, lasting for months, or, as in one case, for eight years. Filariasis may lead to a form of intermittent hæmatochyluria lasting for many years.

The condition of *Anæmia*, apart from the pernicious variety, has but few sequels. It is commonly recovered from, and women who have suffered at one time from chlorosis are subsequently found to have good health, and to bear children satisfactorily. In certain neglected cases cardiac dilatation leading to grave symptoms may ensue; but adequate, that is prolonged, treatment should avail to avert any such sequel.

As a constitutional condition, however, we may,

I think, affirm that anæmia distinctly leads to gastric ulceration. It is certainly uncommon to meet with this disease in either sex if the patient's blood is of due corpuscular richness, and adequate in respect of hæmoglobin. We may not accept the opinion that anæmia is the cause of Graves' disease, although there is not seldom some degree of this present, occasionally induced, as it would appear, by rebellious and intractable diarrhœa. I agree with Trousseau that many cases of anæmia require treatment extending over three years.

Ren Mobilis.—Displacement of the kidney may lead to several troublesome consequences of which pain at the menstrual periods is a frequent one. Occasional strangulation of the vessels and ureter may occur leading to hæmaturia, to occlusion by kinking of the ureter, with temporary hydronephrosis. The hepatic flexure of the colon is apt to suffer by contiguity to the right, and commonly displaced, organ, and sometimes irritation is set up which ends in the establishment of adhesions between this part of the bowel and the kidney. Fears may thus come to be entertained of serious new growth in the colon, owing to localised pain, sense of fulness and resistance, and symptoms of partial obstruction of the bowel.

Renal Diseases.—There are no recognised sequels of diseases of the proper structures of the kidneys which cannot be readily explained by the natural outcome and influences, far reaching enough as they are, of the original disorders of these organs. We are as yet, however, in ignorance of the ultimate clinical history of cases, which we often meet with, known as examples of albuminuria of adolescents, or cyclical abuminuria. We know that many persons so affected ultimately recover, but we wait for knowledge of the life-histories of many more, in order to be able to frame a prognosis for them, and to direct the management of such cases. Paroxysmal hæmoglobinuria is met with sometimes in persons subject to Raynaud's disease, though not as a sequel. In my opinion, the former is sometimes but a phase of the latter state. Hæmoglobinuria of the toxic variety, due to dissolution of the blood-corpuscles, is sometimes witnessed as the result of the specific infectious fevers, such as scarlatina, variola, yellow fever, enterica, malaria, and syphilis.

Chemico-toxic Sequels.—Dr. Alexander Scott, of Glasgow, has recently recorded a case of poisoning by carbon-monoxyde vapour, in which a form of dementia resulted with occasional and

partially lucid intervals, and he tells of a similar case reported by Stockes of Lucerne.[1] The symptoms continued for three months, up to the time of recording the case, in Dr. Scott's patient, and in the other case were present two years after the poisoning. Slight but very slow improvement occurred in both instances. The explanation of the symptoms afforded by Dr. Scott, is to the effect that the carbon-monoxyde combines with the hæmoglobin of the blood, forming a stable compound, carboxy-hæmoglobin, which will neither diffuse nor dissolve, which resists displacement by oxygen, and is very slowly and with difficulty got rid of.

The nutrition of the body thus suffers, and, in particular, that of the brain and nervous system, with the induction of long-abiding mental and other symptoms.[2]

Carbon-monoxyde may also lead to one variety of toxic hæmoglobinuria.

[1] *Lancet*, Jan. 25, 1896, p. 217 (Clin. Lect. Glasgow Royal Infirmary).

[2] My friend, Dr. Arthur Gamgee, has kindly offered to me the following criticism of Dr. Scott's theory respecting the action of carbon-monoxyde on the blood. He remarks that "the compound of CO with hæmoglobin, though much more stable than the analogous O compound, *is very readily dissociated in the animal body*, and we have positive evidence that within

As examples of other chemico-toxic sequels, we have the ultimate effects of arsenicism in producing melasma, zona, tylosis, and peripheral neuritis; rapid tuberculosis and œsophageal stricture following the destructive action of corrosive poisons on the mucous membrane; gout supervening on plumbism; saturnine nephritis, neuritis, and encephalopathy; tabes sicca from zinc-impregnation; skin-discoloration from silver salts;[1] tremor from mercurial poisoning; and neuritis caused by alcohol and by bisulphide of carbon.

Lastly, amongst favourable sequels may be

a very short time blood which has been almost saturated with CO throws off the gas completely. The explanation of the serious cerebral symptoms is doubtless a very difficult one. The brain-cell is so delicate a structure that it cannot, even for a few hours, tolerate with impunity oxygen-starvation; and the simultaneous poisoning by imperfectly oxydized or un-oxydized products—the consequences of such starvation—may make themselves felt long afterwards in deviations from normal function. It is as erroneous to suppose that the brain-symptoms which follow acute poisoning by CO are due to the altered compound of CO with hæmoglobin, as it would be to argue that the neuritis which follows chronic poisoning by alcohol and other toxic agents is due to a retention of the toxic agents." My own view of the matter is quite in accordance with that of Dr. Gamgee, and no one can dispute his authority on such a question. *Vide Proc. Royal Soc. London*, vol. lix. Feb. 13, 1896.

[1] In one case of this kind (argyria) I found staining of the lining of the aorta. *Path. Soc. Trans.*, vol. xviii. p. 59, 1867.

mentioned the rare occurrence of involution, or withering, of malignant growths. This is met with in old persons in whom cancer often remains almost stationary. Dr. Robert Liveing and Mr. Morrant Baker had under their care a case of fibro-sarcoma of the scalp in a young man aged 24, which slowly underwent involution. When last seen, four years later, the process of atrophy had greatly exceeded that of growth. (*Catalogue of Anat. and Path. Museum of St. Barth. Hosp.*, vol. iii. p. 323, 1881–93).

Having now discussed, so far as I am able, the various consequences and sequels of diseases, some of which may possibly have been wrongly interpreted, or summoned and alleged to do duty for them, by reason of the mental temper which always besets an eager inquirer into any particular set of circumstances, I may sum up my efforts by endeavouring lastly, and concisely, to classify, in accordance with the most recent knowledge available, the sequels that have come under notice.

I mentioned at the outset of these lectures that a distinction should be made between complications, even late ones, of diseases and the sequels of them. I have tried to make this distinction, but it has not been quite an easy matter to do so.

We are strictly concerned with the consequences of disease, or, in other words, the diseases of convalescence. A consideration of the whole group of acute infectious diseases, which furnishes the greater number by far of those which have sequels, shows up this difficulty very strongly, for we have found that most of these consequential troubles owe their existence to specific residual infective elements which have lain dormant, or more or less latent, within the body, giving rise either to early or late sequels. These are, therefore, to be termed Bacterio-toxic or Microbic sequels. Of these we have examples in the various fevers, in diphtheria, influenza, malaria, and syphilis. We have seen that these may be manifested very variously in different organs and parts of the body. When affecting the nervous system they lead to central or to peripheral symptoms, according to the locality involved.[1] With these, we sometimes find associated sequels dependent on fresh invasion by microbic elements non-specific of the primal disease, but which are ever ready either within the system, or outside of it, to alight upon parts that have recently

[1] *Vide* Dr. Buzzard's Inaugural Address, Clin. Soc. London: *Clin. Soc. Trans.*, vol. xxix. pp. lviii–lix. 1896.

been rendered vulnerable by pre-existing morbid processes. These I term Indirect Sequels. We have seen that certain acute diseases sometimes reveal diathetic proclivities hitherto little marked, or even dormant, as in the cases of gouty or strumous habits of body ; or, which, as in the case of syphilitic taint, awaken long latent residues, and so evoke revealing symptoms of unexpected character. These I term Revealing Sequels.

The debility and diminished tissue-resisting powers of the body, induced by acute diseases or by exhausting influences and low state of health, open the door to fresh invasion from within or from without, and in this way invite new sequels, and often a succession of diseases.

So-called "surgical scarlet fever," is, without doubt, an instance of true infection by that specific disorder to which patients are particularly prone after the shock and wound of an operation, owing to the vulnerability and susceptibility thus induced.

Traumatism of many kinds is apt to be followed by revealing symptoms of some constitutional tendency or taint. Thus, we have instances of puerperal septicæmia, set up by invasion of varieties of specific and toxic microbes.

We meet with cases in which tuberculosis awakens and rages after injuries to the head and

other parts of the body, such as joints, and we have already noted the occurrence of erysipelas as an attendant on traumatism.

We may take note of the diathetic and local determinants which materially affect the original incidence and the sequels of diseases. Weak points are attacked, areas of special vulnerability, and organs and parts whose functions are inherently inadequate—*loci minoris resistentiæ*. We perhaps too little regard the frailties of particular organs and tissues, frail by inheritance, and prone to premature failure and decay, although adjacent to other and more robust portions of the frame of the individual; for likeness of organs and tissues goes by descent as does mere likeness of features. Hence many puzzling conditions and surprises in the study of diseases. But the clinical physician must take note of such.

Nervous Sequels relate chiefly to neuro-trophic disorders and neuralgia.

Sequels due to Chemico-toxic Influences.—Respecting many of these, we have to note the fact of symmetrical or bi-lateral nervous affections, due to general impregnation of the system through the blood.

DISEASES OF CONVALESCENCE AND SEQUELS OF DISEASES.

COMPLICATIONS OF DISEASES.

(*a*) Early.

(*b*) Late. Incomplete convalescence.

SEQUELS.

A. *Bacterio-toxic.* (*a*) Early, microbic or germinal with short latency.

(*b*) Late, microbic or germinal with longer latency.

Residual diseases. Ultimate evolutions or manifestations of the original disease.

(*c*) Direct, specific of the primary disease.

(*d*) Indirect, induced by the primary disease, but due to fresh or secondary infections by new toxins,

(*a*) Already present in the body, or

(*b*) newly introduced from without (mixed infections),

Hence, succession of diseases.

B. *Revealing.* Determinative of manifestations of constitutional habits of body or of inherited or acquired specific (germinal or particulate ?) taint.

C. *Nervous.* Neuro-trophic. Neuralgic.

D. *Chemico-toxic.* Arsenic, lead, mercury, silver, carbon-monoxyde, corrosives.

E. *Direct, non-toxic.* Residual sequels probably determined to certain localities by tissue-predisponency,

(*a*) inherited, or

(*b*) acquired by previous injury—*loci minoris resistentiæ.*

We have found that most sequels of diseases are an increased burden for the patient, but we have also noted that a few of them are even favourable and happy. The great fact remains that the majority of sufferers from all manner of diseases are not the victims of sequels, and that for this majority the course of their maladies, when not directly fatal, is singularly and fortunately free from any important consequences.

A study of the subject of the sequels of diseases cannot, however, fail to impress upon all of us who are actively engaged in treating patients during their illnesses, the supreme importance of steadfastly regarding the patient, and not so much his disease, in all our therapeutic management. To conduct the patient prudently and safely through his troubles, to realise how he bears them, what they mean, or may mean, to him, to gauge his powers of tissue-resistance, his reserves of vital power, to have regard to his mental condition and to all his particular environments, and to secure sound convalescence, is, as far as is possible, to avert the worst consequences, early or remote, of the particular malady in progress. This, and no less than this, is the duty which lies before each one of us, and to carry it out effectually demands the best qualities both of

head and heart that we can place at the disposal of our patients. And such qualities, Sir, I venture to say have not been wanting in the lives and work of the majority of the great and good men, who have adorned this venerable College, and left us the legacy of their skill and of their characters; who have no less laid us under the obligation to maintain here, as the Physicians of England, the highest standards of work, of duty, and of professional honour. May we try and be worthy of our predecessors! We can hardly surpass them in any of these qualities.

It only remains for me to offer to you, Sir, and to this auditory, my best thanks for the kind attention given to me in this course of lectures.

THE PROGNOSIS OF DISEASE

βραχεῖ δὲ μύθῳ πάντα συλλήβδην μάθε,
πᾶσαι τέχναι βροτοῖσιν ἐκ Προμηθέως.

Æschylus, P.V. 505–506.

THE PROGNOSIS OF DISEASE

I VENTURE to state that at the present time, and for many years past, in spite of the extraordinary advances made in all branches of the Sciences on which Medicine depends, in spite, too, of the high degree of cultivation to which the Art of Medicine has attained in the last years of this century, the attention of Physicians has been somewhat inadequately directed to the subject of Prognosis in diseases. Our minds have been much, probably too exclusively, intent on acquiring accurate knowledge of facts, and we are now encumbered with a mass of details and microscopic minutiæ, so large and so pressing, that few amongst us have had time for a meditative survey of them in order adequately to apprehend the great general laws which underlie and govern them. Our views are thus apt to be narrow and distorted; we argue too much from the particular, we fail to see things in due proportion, and so less seldom than

we might have a right judgment in things medical.[1]

We must, if we are to be great in Medicine, sometimes lift our eyes from the microscope, and away from the engrossing researches of the laboratories; and rising to a higher platform, survey the larger fields and vistas which lie before and beyond us. If we do so, we shall certainly come to know more of the inwardness and due proportions of matters which relate to the life of man as he passes through his present environment. We need both the talent of the ancient philosophers who had an eye for general truth, and the qualities of the modern philosopher whose eyes are so much set on particular facts. The problem now before our profession is to combine these in due harmony, and as I have expressed the opinion that we have somewhat failed in modern times to gather knowledge as did the ancients, I purpose to address myself in this

[1] If this is true for us as active practitioners, how much worse is the case for the modern student of medicine? The education of to-day is perhaps rather overladen with details, and somewhat barren of the inculcation of general principles; hence I fear we may come short in the production of men properly equipped to think for themselves, and to help in carrying forward our Art towards greater completeness and perfection.

prelection to a much neglected subject, that of prognosis[1] in Medicine considered by the light of our most recent attainments. This study takes us back at once to the great Father of Medicine, our supreme guide in this matter, who laid an enduring foundation for us two thousand years ago in his splendid treatises on the Prognostics.[2]

In recent times, the literature relating to prognostics has been far to seek. I know of no work purely relating to the subject which has been published in this century.[3] The most remarkable book on Prognostics is that of Prosper Alpinus,[4] Professor of Medicine at Padua, who published his famous treatise in confirmation of

[1] = prescience (*πρόνοια*).

[2] (1) *προρρητικόν, ά*, (2) Κωακὰι *προγνώσεις*, (3) *προρρητικόν. β'.*

[3] I may, however, refer to the *Cours de Médecine Clinique*, "Traité Élémentaire de Diagnostic, de Pronostic," &c., par Leon Rostan, troisième partie, du Pronostic, vol. iii., Paris, 1830: *Cyclopædia of Practical Medicine*, vol. iii. art. "Prognosis," by Edward Ash, M.D., p. 510, Lond. 1834. "Observations on Prognosis," vol. xliv. *Guy's Hosp. Rep.*, 1887, P. H. Pye-Smith, "Observations upon Certain Elements in General Prognosis, and upon the particular Prognosis of Phthisis and of Enteric Fever," P. H. Pye-Smith, *Sheffield Med. Journ.* part ii. vol. i.

[4] *De Præsagiendâ Vitâ et Morte Ægrotantium*, Patavii, 1601, libri septem. "The Presages of Life and Death in Disease," translated by R. James, M.D., London, 1746, vol. ii.

the Hippocratic method in 1601, an edition of which was issued at Leyden with a preface by Boerhaave in 1709. I am indebted to our learned Librarian at the Royal College of Physicians, Dr. Munk, for an acquaintance with these volumes, and no less for his kindness in handing to me for perusal the manuscript of his own Oration on Prognostics delivered before the Hunterian Society of London in 1858. From the latter I have learned how it was that the study of prognostics came to be disregarded towards the close of the last century. "Coincidently with the return from the polluted stream of Arabian Medicine to the pure fountain of Grecian physic, was the renewed cultivation of a rational and scientific prognosis. . . . It was in connection with a humoral pathology that prognosis made the greatest progress, and achieved its highest triumphs. . . . The doctrines of solidism on the other hand have uniformly proved inimical to the study of prognosis. . . . Prognosis was but little regarded by Hoffman, and still less by Cullen. To the neglect it experienced from the luminary of the Edinburgh School, its decadence in this country is to be attributed. The pupils of Boerhaave and of the school over which this name and example continued to shed lustre, were

still cultivating prognosis in all its minutiæ, and applying its rules with startling accuracy, at the very time when Cullen's genius blazed above the medical horizon, and it was not until these had died off, and Edinburgh had taken that place in public estimation as a medical school, which Leyden had previously enjoyed, that the regular, minute, and systematic study of a rational prognosis became extinct in this country."

I think that a just consideration of the prevailing doctrines of pathology at the present time may encourage us to hope that renewed attention and study may henceforth be directed to the subject of prognostics.

The exactness and precision of modern biological inquiry may fairly incite us to fresh research in this direction, and I think we have already some indications that such is likely to prove fruitful and profitable.

Thirty years ago, Dr. J. Russell Reynolds, in his introduction to his *System of Medicine*,[1] declared that the "practical test of a true science is the power which it confers of 'prevision,' or knowing now what will follow hereafter. . . . . When we can prognosticate with certainty, medicine will have become a science. At present

[1] Vol. i. p. 21, 1866, Introduction.

we only with different degrees of nearness approach this end. We may describe the 'probabilities' of a given disease; we may even measure them; we may accept or reject lives at insurance offices; or we may affix a numerical value to their duration, but we deal with doubts, and not with certainties. Life is too subtle for us to know or measure all its possible contingencies." He further indicated that "in prognosis we have almost always two ends to be considered —the immediate effects of the present illness, and its remote consequences upon life." . . . "The former turns upon the degree to which great vital functions are interfered with; the latter depends upon the nature of slighter changes, of which pathology teaches us the meaning." After this interval of time, it is of interest to note what the author of the newest *System of Medicine*,[1] has to state in respect of prognostics. "As observation becomes more accurate, as the number of observed cases increases, and as classes are better and better distinguished, the nearer will the physician be able to approach an accurate prognosis—though the time when any sufficient rule can be applied to individual cases must long be out of our sight; and the application of any

[1] Vol. i. p. xxxix. 1896, Introduction, Prof. Clifford Allbutt.

approximate rules must long be subordinate to the instinctive tact of the educated physician himself, who alone can apprehend the sum of the peculiarities which must modify their application to individual instances."

We have here the views of two careful and experienced physicians, and a consideration of their opinions might well make one hesitate a little before embarking on a task such as I have set before me. I feel, however, that such an effort is called for, and the duty of making it one which may rightly be claimed from those who have had a long and chastening experience of practice both in public and private. I am encouraged in making this attempt by the thought that I may thus induce others to follow me in affording such knowledge as they may have in respect of matters relating to prognostics.

It is certain that we can only make advances in prognostic skill by careful and patient study of the whole subject of semeiology, and on few parts of our Art has greater light been shed during the last half-century than on this. We cultivate the study of semeiology for three reasons: first, to enable us to make a diagnosis; secondly, to direct the treatment of the case: and thirdly, to help us to frame a prognosis. Every-

thing therefore, depends on an accurate appreciation of the symptoms and the physical signs presented to us in any case. If we err at the outset our treatment and our prognosis will also err. As I have just said, there is, assuredly, no lack of teaching in these days directed to the subject of semeiology in its several parts, but I think it must be conceded that our eyes and our minds are rather apt, in consequence, to dwell too much on our detailed notes and our manifold instrumental aids, and too little on the patient, his personal peculiarities, and the intimate nature of his ailments.

We thus miss the due recognition of noteworthy features proper to the whole case, features often eloquent and provocative of further inquiry when appreciated by the trained eye, and the open mind accustomed to view the whole and not merely a part, and thus to see every point in due proportion and in proper relation to the rest.

This difficulty meets us not seldom in respect of estimating the value of Lives for the purpose of Assurance. We have now to fill in a very long schedule with a cumbrous mass of details, and a few minutes to do it in. The tendency is to be so engrossed in gathering such a number of facts that there is little time left for a review of them

in the presence of the candidate, and it happens in my experience that the conclusions formed on reading through the document, not seldom inadequately express the value of the Life thus examined. The organs may be found in detail free from structural disease, but there may be appearances and features indicative of progressive failure not yet registrable by the stethoscope or the test-tube, of which the significance is of the last importance, and these may escape recognition and appraisement. The examiner is too busy with pen and instruments to gauge the real inwardness and pregnant points of the case. A little more attention to the individual, his aspect, his gait, and his manner, would sometimes be well-repaid in a sounder appreciation of his life-value. And the same holds good in daily medical practice. I am constantly training students to begin by looking at their patients. The first thing they commonly attempt is to percuss or to auscultate the chest. I try to make them form an opinion of the case by mere inspection without asking a single question, to guess the age, occupation, habit of body, and tendencies. Having done this, they proceed to verify or correct their primary impressions, and this is a most wholesome method. It occupies much time, but

the time is well-spent, and the value of such training in after-life must be considerable. In semeiology the order is first, symptoms, and secondly, physical signs. Then comes the consideration of their relation to the whole case, and with these we have the indications for rational treatment.

No two cases being alike, we have always to keep an open mind, and have regard to what disease means to the particular individual before us, to consider how he is likely to bear it, and to come through it, the personal factor being accurately considered in each case. Bearing in mind these points, and paying attention to the diathetic tendencies and the peculiar environments of each patient, we are then, and only then, in a position to frame a prognosis respecting his malady. And, no less, is attention necessary to discover both in health and in disease such indications as may be discovered from the physiognomy of each individual. Having had the good fortune to have been trained in this study by my late preceptor, Professor Laycock, of Edinburgh, I may declare here and now that I have constantly had occasion to appreciate the great value of it in aiding me in respect of both diagnosis and prognosis. This is a closed chapter

of medicine to many, as I well know, but its study will well-repay diligent attention to it, and prove sometimes of singular value in practice.

By itself this method is, of course, insufficient, but supported by careful physical examination, which corrects or confirms the primary impressions, it comes to the aid of the physician in no small degree, and puts him, not seldom, promptly on the track of morbid action or of degenerative processes.

And, in like manner, in the course of acute or of chronic diseases, careful and trained observation detects signs and phases which, if duly noted and considered, may greatly help in framing a prognosis of the particular case before us.

A study of the prognostics as laid down by Hippocrates is useful to every practitioner of medicine, and must always be so. It is difficult to be certain of the nature of some of the diseases to which he alludes; and sometimes in the case of those about whose nature there can be little doubt, modern experience forbids our entire agreement with the great Master. To take but one example, ἐπι αἵματος ἐμέτω φθορη,[1] (*phthisis ab hæmoptöe*), a question once much debated in the schools, has quite lost its force for

[1] *Aphor.* vii. 79, 80.

us to-day, since we have ceased to believe that simple hæmorrhage into the pulmonary parenchyma can induce phthisis in the absence of the specific tubercle-bacilli of Koch ; and have instead accepted the view that the primary feature in the case is the malignant work of these parasitic microbes, with, as a secondary result, the hæmoptysis.

It would prove an impossible task to attempt within the compass of this address anything like a complete study of prognostics as applied to all the diseases of which we have definite knowledge. I propose, therefore, in order to be methodical, to discuss the subject in relation to diseases generally of the several systems of the body, and I shall endeavour to be concise without being tedious.

Taking first the large section of

SPECIFIC INFECTIOUS DISEASES,

I will mention some prognostic points in relation to *Enteric Fever*.[1] Hyperpyrexia is only of grave import when rebellious to ordinary cooling methods, and amongst these I do not include the

[1] With respect to fever generally, I may quote Pye-Smith (*loc. cit.*) to the effect that "a degree of pyrexia which is of slight importance in a child, is grave in an adult, and immensely perilous in an old man."

use of cold baths. Obese and elderly patients are bad subjects for all fevers and acute diseases. The existence of chronic renal disease is incompatible with recovery from the continued fevers. Meteorism, delirium, subsultus tendinum, and tremor are always of serious import, indicating failure of nervous power. Carphology is, as declared by Hippocrates,[1] commonly a fatal sign, but I have known it persist for three or four days in a bad case, and good recovery follow.[2] Early hæmorrhage is unimportant. Dicrotism of the pulse often precedes late hæmorrhage. This condition of the pulse signifies exhaustion and deep ulceration of the bowel. The more profuse the hæmorrhage the greater the danger; moderate hæmorrhage is rarely harmful. Vomiting in the third week may be the precursor of peritonitis. Epistaxis is not serious unless profuse, when it may prove fatal. Pregnancy is always a grave complication, and abortion is common. I attended one case, however, in which the patient was six months advanced in pregnancy, and she made a good recovery, and had a child born at term. An abundant eruption of papules does not denote any

[1] *προρρητικόν, ά.*

[2] Murchison recorded similar experiences, and Dr. Cayley informs me that he has also witnessed the same favourable results, *Treatise on the Continued Fevers*, p. 226, 1st edit. 1862.

special gravity, and, *per contra*, absence of eruption certainly affords no ground for belief that the case is a mild one. Excessive diarrhœa is unfavourable. Perpirations, apart from other severe indications of weakness, are not important. Acute tubal and suppurative (pyæmic) nephritis may prove sources of danger.

In the case of *Typhus Fever* we find cause for concern if there be a very copious eruption, especially of petechial character. Severe headache, delirium and stupor, insomnia, strabismus, extreme myosis, epistaxis, subsultus tendinum, carphology, incoercible hiccough, tympanites, and retention of urine are always grave. Early epistaxis is unfavourable. Coma vigil is always a fatal symptom. Nephritis, bronchitis, pneumonia, and parotid bubo are all of ill omen. Abortion rarely ensues in pregnant women with typhus. A presentiment of a fatal issue at the outset of a case is commonly a bad sign. Typhus is uniformly fatal to persons the subject of Bright's disease, and very dangerous after the age of fifty years.

The malignant varieties of the *Exanthemata* and of Diphtheria admit only of the worst prognosis at any age, and under all conditions. The subjects of congenital heart-disease are bad subjects for most of the exanthemata and for

scarlatina in particular. The same is true too frequently for persons suffering from cardiac valvular disease, and the continued fevers are very dangerous for them. I have, however, recorded two cases of aortic reflux in which recovery occurred respectively after severe enterica and diphtheria.[1]

Prognosis is graver in the exanthemata according to the early age of the patient, and the abundance of the eruption. High fever, delirium, hæmorrhages, membranous angina, laryngitis, and parotid bubo are of evil augury in *scarlatina*, likewise suppression of urine from intense toxic glomerular nephritis.[2] According to Kanthack and Sevestre, a high leucocytosis in scarlatina indicates a pronounced reaction against a severe infection; a slight leucocytosis usually indicates a mild infection. The prognosis in the milder forms of scarlatinal polyarthritis is good. Purulent arthritis is almost uniformly fatal, unless confined ultimately to one joint. *Measles* is often a severer ordeal for adults than for children. Capillary bronchitis and collapse of large tracts of the lungs constitute the worst symptoms in measles as met with in children.

[1] *St. Barth. Hosp. Reports*, vol. xxv. p. i. 1890.

[2] It seldom takes on a malignant form when it attacks adults (P. H. Pye-Smith).

Our recent experiences of *Influenza* have taught us the special dangers of the peculiar pneumonia of that malady in the case of persons past middle life, and of the grave cardiac asthenia that may long persist. In *Pertussis* the prognosis is more favourable after the second year of age.

The prognosis in cases of *Diphtheria* is certainly less serious now than was the case five-and-twenty years since. We note the exceptional danger for children under two years of age. Early tracheotomy, with aseptic treatment and intelligent nursing, has alone saved myriads of lives that would certainly have been lost in my student-days. Antitoxin treatment has decidedly, in my experience, proved of additional value in diminishing the death-rate. With all this we must still accept Sir W. Jenner's *dictum* that "no case of diphtheria is unattended by danger."

If a week elapses without laryngeal complications we may fairly hope that the larynx will escape invasion by membrane. After this, our anxiety relates to the welfare of the heart and of the nervous power of the patient. The spreading specific neuritis, with its varied symptoms, constitutes a danger sometimes little short of that induced by laryngitis. Nasal diphtheria should always excite concern. A rapid and feeble pulse, or an infrequent

pulse, are bad signs in any case. Vomiting is of evil augury, especially if rebellious. Epistaxis or other hæmorrhages indicate a grave case, owing to profound systemic poisoning, inducing what the old physicians called "a dissolved state of the blood," in which diapedesis occurs. Albuminuria in small degree is almost the rule in every case, and is hardly to be seriously considered unless it is in large amount, and uræmic symptoms supervene. It is not unlikely that there may be a conjoint impregnation in some of the latter cases with scarlatinal poison. Delirium in diphtheria is always a bad sign. There is more risk of serious symptoms due to systemic intoxication in the adult, and more danger from laryngeal infection in the child.

According to Kanthack and Lloyd, well-marked leucocytosis gradually falling, together with decline of temperature, indicates a good reaction, and justifies a favourable prognosis. Low leucocytosis, or absence of this, with fever, is a bad sign. High leucocytosis, with subnormal temperature, is also of bad augury. Other observers, however, are not in agreement on these points.[1] The question

[1] Morse, "Leucocytosis of Diphtheria," *Boston City, Mass. Med. and Surgical Reports*, 1895. "Leucocytosis is of no value in prognosis."

Gabritschawsky, *Annales de l'Inst. Past.* 1894, tom. viii.,

of leucocytosis as an element in prognosis will come before us again in relation to some other diseases.

If *Variola* attacks persons with Bright's disease, a fatal issue is certain. The eleventh or twelfth days are the most critical; and laryngeal or pulmonary complications the most fatal. The disease is deadly for unvaccinated infants and for the aged.

Erysipelas is likely to prove fatal if it sets in with severe constitutional disturbance and vomiting, especially in the aged and in previously intemperate persons. Phlegmonous erysipelas of the head is the most grave and often fatal. In the new-born, if the navel is attacked, a fatal issue is common. The toxin of erysipelas is deadly to the parturient woman, as was pointed out by Hippocrates.[1]

p. 673. "A progressive hyper-leucocytosis in diphtheria justifies a bad prognosis."

Ewart, *New York Medical Journal*, 1895, Aug. 10 and 17. "In unfavourable cases leucocytosis continues till death. In prolonged septic cases there may be an uninterrupted decrease of leucocytes till death. High leucocytosis = pronounced reaction, but not necessarily an unfavourable prognosis. Steadily decreasing leucocytosis usually accompanies a favourable course. Slight leucocytosis usually indicates a mild infection, but fatal cases may for several days show no increase or even a decrease of leucocytes."

[1] Aph. 43, sect. v.; Aph. 2, sect. v.; Aph. 6, sect. v.

In *Yellow Fever* an early high temperature is to be regarded as grave. Black vomit is not necessarily of fatal omen, but suppression of urine, delirium, convulsions, and coma almost certainly preclude hope of recovery.

Tetanus.—The teaching of Hippocrates holds good to this day in respect of the commonly fatal issue of "spasm supervening on a wound," and no less as to the better prognosis which may be framed in a case that has survived the spastic condition for some days. Rapid onset of spasm after injury—*i.e.*, short incubative period—is more grave than slow or gradual onset of symptoms. The outlook is serious after abortion or during the parturient condition. The chance of recovery increases with each day of the prolongation of the disease, but the danger is great till the second week is passed. Death may occur a month after the onset of symptoms. The outlook is better if the spasms are confined to the jaw and the muscles of the neck, and do not involve the trunk and limbs, also if they are neither severe nor frequent.[1] (I might venture here to affirm that smart purgation in these cases is perhaps

[1] *Vide* Article on the "Prognosis of Tetanus," by G. V. Worthington, M.B., *St. Barth. Hosp. Reports*, vol. xxxi. p. 137. 1896.

not sufficiently practised.) The disease is more deadly amongst dark-skinned races. Our experience of specific anti-toxin treatment is as yet insufficient to enable us to form a decided opinion of its value, but it appears to be encouraging.

Syphilis.—The prognostics respecting this disease relate largely to individual peculiarities, habits, and environment, to the adequacy of treatment, and the degree and virulence of primary impregnation. It is certain that the greater number of persons so infected ultimately recover satisfactorily if they have been properly treated from the outset. It is equally certain that the character of the primary lesion does not enable us to prognosticate the ultimate evolution of the malady.

Death is extremely rare in the second stage. Tertiary symptoms occur in about 10 per cent. of all cases, and in but few of these are vital organs affected. They may be met with in the third year, but some of the latest manifestations may be active half a century after primary infection. Many of these yield to vigorous treatment. In visceral syphilis, death generally occurs under forty years of age. Cardiac syphiloma usually kills at the fifth climacteric. Syphilis acquired after the seventh climacteric is always more grave than in young adults, organic degenerative

changes having generally begun by that time, and the prognosis in these cases is unfavourable. A graver prognosis attaches to the disease in the lower classes, who are often inadequately treated, and who are careless, exposed to hardships, and intemperate in alcohol.

Recent malarial impregnation and recent syphilis, with splenic enlargement, together form a very serious combination, and a fatal issue is common within twelve months in such cases.

Pyæmia and *Septicæmia.* — If organisms be present in the blood of the patient and capable of cultivation from it, the prognosis, according to Kanthack, is bad.

Prognosis in relation to *Tuberculosis* is a large question. The factors on which determination has to be made vary greatly with the individual and his environment. Without doubt, the prognosis of all disorders of a tuberculous nature admits of a more hopeful view at the present time than formerly. Rational treatment following on exact pathology explains why this is so. The tissue-resistance of the individual counts for much. Under the age of twenty phthisis is very fatal; after thirty-five a better prognosis may commonly be made.

Hughes Bennett taught, and I think correctly, that no disease was so often recovered from as

In tuberculous pyo-pneumothorax, the practice of paracentesis may encourage rapid extension of tuberculosis. Hæmoptysis, *per se*, is never fatal in phthisis unless it results from a ruptured aneurysm of a branch of the pulmonary artery.

Empyema treated early on modern surgical principles admits of a very favourable prognosis, resection of one or two ribs being practised.

Passing on next to consider some points respecting prognosis in various *Constitutional* diseases, I may refer first to *Diabetes*. We have to deal with two main classes of patients thus suffering, the lean and the fat. The former present the worst cases, the disorder being more or less acute. As is now well recognised, the younger the patient the worse the prognosis. An originally good constitution counts for something even in these cases. Every additional decade of years helps towards a less grave, or immediately grave, outlook. Coma is less often met with as a fatal precursor after the age of thirty-five years, but it may prove to be the termination of cases at later ages after the onset of acute intercurrent disorders such as pleurisy, pneumonia, or after pulmonary tuberculosis, or gangrene of a limb.

The fat diabetics, so-called, are often gouty, and suffer from a mild form of glycosuria. They are, not seldom, not diabetic in any true sense.

They are however vulnerable, and their lives are, though often prolonged by care and judicious treatment, always precarious. Speaking generally, after forty years of age the outlook becomes less serious. Loss of knee-jerks in any case is to be regarded as a bad sign, and the presence of diacetic acid in the urine is grave and significant of danger sooner or later. Chronic cases of diabetes in the elderly may go on fairly well in persons of fine constitution for thirty years. I have never known recovery from coma in any instance. The only case I have read of, occurred in a woman, æt. 67, in whom, after five hours of insensibility, recovery followed the inhalation of oxygen gas, together with calomel purgation and the employment of ether, ammonia, and morphia. The patient made good progress on restricted diet, and was fairly well six months afterwards.[1] I have seen threatenings of coma in diabetes distinctly averted by purgation with castor-oil.

Purpura (Purpura cachectica) supervening on any chronic disease is of evil augury, and is amongst the latest of malign symptoms in cases of cancer, tuberculosis, Hodgkin's disease, Bright's disease, and heart-disease. Petechiæ are most

[1] *Trans. Intercolonial Medical Congress of Australasia*, L. W. Bickle, L.R.C.P. Lond., Mount Barker, S.A., p. 97, 1893.

often found on the lower extremities, but may occur on the back, or indiscriminately. Some cases of rheumatic purpura are malignant and fatal.

In *Hæmophilia*, profuse bleedings are more likely to prove fatal in the first climacteric period. The risks diminish somewhat with advancing years, and recovery, with rapid hæmopoiesis, may follow upon an attack so grave as to cause the patient to be almost exsanguine. The capacity for hæmopoiesis in these cases is quite remarkable.

In *Rheumatic Fever*, if the seventh or eighth day be surpassed, and no cardiac complication has supervened, we may not expect the occurrence of any form of carditis, or of pericarditis; but if a relapse occurs, we may meet with this as a manifestation of the fresh attack. The younger the patient, especially if of the female sex, the greater the risk of rheumatic carditis, whether endocardial or pericardial, and the absence, in early life, of arthritis should lead to more solicitude as to the latter condition. Incoercible hyperpyrexia is generally fatal in rheumatic fever, as in other diseases. Subcutaneous nodules are of evil omen.

DISEASES OF THE DIGESTIVE SYSTEM.

Cancer of the Stomach commonly proves fatal within a year from the time a certain diagnosis is

made. Those cases last longest, and have less suffering, in which neither orifice is involved.

In *Cirrhosis of the Liver*, if signs of toxæmia set in, life will not be prolonged many days. Tapping of ascitic fluid may aggravate the nervous symptoms of such toxæmia. If a free collateral circulation is gradually established between the portal and systemic veins, life may occasionally be prolonged for some years. Copious hæmatemesis or melæna is of very serious import, and a recurrence of either is generally fatal.

Cancer of the Liver is usually fatal within twelve or fifteen months, but sometimes rapidly growing tumours may carry off the patient in a few weeks.

Cancerous growths of the Peritoneum commonly kill within a year.

Diarrhœa is unlikely to prove fatal except in children and aged persons.

Typhlitis.—Many cases recover under judicious medical treatment.

Perityphlitic abscess, if opened carefully about the ninth or tenth day, and the peritoneal cavity escape contamination with its contents, may generally heal favourably. Earlier surgical interference is very apt to lead to a fatal issue by toxic peritonitis (J. Berry), *vide* Statistical Tables, *St. Barth. Hosp. Reports*, p. 176, 1895.

A gangrenous state of the vermiform appendix, if diagnosticated, demands an early operation.

Gall-stones.—The prognosis of cases in which gall-stones are believed, or proved, to exist in the gall-bladder is always uncertain. We know that many may be present for years, and give rise to few or no symptoms; also, that a few may be present and cause serious attacks of biliary colic. Continued irritation from them may induce cancer of the gall-duct, the gall-bladder, and the liver. Obstruction of the small intestine, commonly the ileum, is sometimes a grave complication due to plugging by a biliary calculus. Modern surgery leads us to frame a more hopeful prognosis in many of these cases. A calculus may be removed from the bowel, and the gall-bladder may be emptied of calculi with complete relief of all untoward symptoms. I am unaware of any methods of treatment, either by diet or by drugs, which can cause removal of any calculi already formed, but their further formation can certainly be prevented by appropriate medical procedures.

DISEASES OF THE RESPIRATORY SYSTEM.

In few diseases is the question of prognosis so important as in *Lobar Pneumonia.* Hughes Bennett used to teach, and all practical physicians

now agree with the doctrine, that "a sthenic single pneumonia in a previously healthy young man gets well." Single or double pneumonia is fatal in a drunkard, or when associated with delirium tremens. Pneumonia supervening in patients with pulmonary emphysema is fatal.[1] It is grave in rheumatic fever. Herpes labialis is a sign of good augury in the great majority of patients, and mostly accompanies cases in which a sharp crisis occurs on the sixth day. Grave and prolonged cases with deferred crisis, and some pleural effusion, not seldom present no herpes labialis.[2] Abundant rusty sputa, bright in colour, in a lean, even if elderly, patient are a good sign.[3] Sweating and moderate diarrhœa at the time of crisis are also favourable indications. Sputa of the "greengage" colour, or of bistre tint, are not of good augury, and sputa of an uniform dirty

[1] According to Dr. Norman Moore, recovery is possible in persons with a healthy (unaffected) lung weighing 22–24 oz. But if the unaffected lung is wasted by emphysema, and only weighs 15 oz., there is respiratory incapacity, and no possibility of maintaining life till resolution occurs in the affected lung.

[2] Pneumonia of septic origin, as from drain-poison, is commonly fatal, and herpes is rarely met with in such cases.

[3] "The less the weight with a given height, and the more red blood in the sputa, the better the chance for the patient" (Sir W. Jenner).

orange colour (like anchovy sauce) are of especially bad omen. In pneumonia of the apex, delirium may be anticipated, both in children and adults. In the subjects of Bright's disease, the prognosis is very grave. Indications of dextro-cardiac distension and general cardiac failure are always serious. Modern research has shown that leucocytosis is commonly of favourable import in pneumonia, and both laboratory experiments and clinical inquiry attest the value of this indication. My colleague, Dr. Kanthack, has for some time past lent his aid in investigating this point, and with Mr. Lloyd, a former research clerk of mine, has fully confirmed the observations of Von Limbeck, Billings, and others.[1] They find that

[1] Billings, "On Pneumonia," *Johns Hopkins Bull.*, vol. xliii. (1) If favourable = marked leucocytosis during fever. (2) Prognosis in cases showing a complete and continuous absence of leucocytosis is, as a rule, unfavourable. (3) The presence or absence of leucocytosis only shows the virulence of bacterial poison. It is not a criterion of absolute prognosis.

Ewing, *New York Med. Journal*, Dec. 1893. It may be said, that a considerable leucocytosis is no indication that the case will pursue a favourable course. In several instances when recovery followed, high leucocytosis was found at the time when the condition was thought to be hopeless. In severe forms of pneumonia slight leucocytosis is a very unfavourable sign. (Ewing only made a single examination, and does not consider the temperature chart.)

Croupous Pneumonia (Von Limbeck) *Clinische Pathologie*

an active inflammatory leucocytosis during the fever indicates, as a rule, a good reaction and is often, though not always, a good prognostic sign. The multinuclear, neutrophile, or finely granular eosinophile cells are those which are increased in number. Absence of leucocytosis is commonly a bad sign in any case. Diminished leucocytosis with falling temperature is found by Kanthack and Lloyd to be a good sign. Continued high pyrexia with low number of leucocytes is a bad sign. They noted that persisting or increasing

des Blutes. In the majority of cases there is a more or less considerable inflammatory leucocytosis—*i.e.*, increase of the multinuclear (or neutrophile or finely granular eosinophile) cells (often the leucocytic and the temperature curves run a parallel course). A good leucocytosis during the fever, as a rule, means a good reaction, and is often, though not always, a good prognostic sign. Absence of leucocytosis is often, if not always, a bad prognostic sign. This agrees with the animal experiments of Tschistovitch:—(*a*) Highly virulent cultures of pneumococci in rabbits = no leucocytosis or diminution of leucocytes, and rabbit dies. (*b*) Weaker cultures = marked leucocytosis, and animal survives. (*c*) If animal comparatively resistant (dog), comparatively slight leucocytosis.

Observations on Animals, Kanthack, Römer, &c.—On injecting bacterial toxins, *if recovery:* (*a*) A sudden drop in leucocytes of short duration. (*b*) This is followed by a rapid rise together with rise of temperature. (*c*) Leucocytosis persists while temperature falls, and then gradually disappears.

If Fatal Dose injected.—(*a*) Leucocytes diminish. (*b*) Remain so:—temperature also generally subnormal.

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Observations on Animals, Kanthack, Römer, &c.—On injecting bacterial toxins, *if recovery:* (*a*) A sudden drop in leucocytes of short duration. (*b*) This is followed by a rapid rise together with rise of temperature. (*c*) Leucocytosis persists while temperature falls, and then gradually disappears.

If Fatal Dose injected.—(*a*) Leucocytes diminish. (*b*) Remain so:—temperature also generally subnormal.

leucocytosis, with fever, is of favourable import. The presence or absence of leucocytosis, *per se*, is not sufficient for a satisfactory prognosis, but taken with the accompanying temperature (and the curves of the two processes are often parallel) it may prove a valuable and favourable indication.

Experimental research on animals confirms these views, since Kanthack and Römer found that on injecting pneumonic bacterial toxin, if recovery occurred, there was, first, a sudden fall in the number of leucocytes of short duration; followed secondly, by a rapid rise of them together with fever; and thirdly, persisting leucocytosis with a gradual disappearance of the excess of leucocytes as the temperature fell. If a fatal dose was injected, the leucocytes diminished, and remained so, the temperature becoming sub-normal.

Kanthack's researches show further, that if the specific organisms (pneumococci), are present in the blood, and can be cultivated from it, the prognosis in pneumonia in the human subject is bad.

In diabetics, pneumonia is fatal. In gouty persons the prognosis is grave, but many of them recover, and recurrence is not uncommon in after-life. In the aged and debilitated the outlook is always serious. If gangrene of the lung occurs, the case is almost invariably fatal. Delirium, dry

tongue, lividity of face, carphology, cold sweats, with failing pulse, chilliness of the nose and extremities betoken a fatal issue.

Pneumonia occurring in persons with valvular heart-disease is commonly fatal.

Pulmonary fibrosis, whenever met with, is an indication of chronicity. As a conservative process it induces protraction of any morbid condition. The tendency to fibrosis is significant generally of resisting power, and pertains only to persons of certain diathetic proclivity, more especially the arthritic. Clubbing of fingers, nose, and toes is a correlative hypertrophy associated with it in most instances.

Broncho-pneumonia.—Spare and lean persons are better subjects than obese ones for this disease, and this applies to all ages. It is deadly to the very young and the very old.

Sarcoma and most of the *malignant new growths in the lung* usually destroy life within six or eight months, but they may kill more rapidly than this.

DISEASES OF THE CIRCULATORY SYSTEM.

Diseases of the Heart.—The outlook is generally better than it was half a century ago.

Pericarditis of rheumatic nature is very rarely fatal *per se*. I never meet now with the extensive

effusions which were common thirty years ago, and which led to fatal syncope. In Bright's disease, pericarditis is commonly fatal, and septic pericarditis is uniformly so. With the practice of aseptic surgery, purulent pericarditis is no longer to be regarded as necessarily fatal. Tuberculous pericarditis may be rather protracted, but is beyond recovery. Pneumo-pericardium is commonly fatal within two days.

The principles on which a prognosis is framed in respect of valvular disease are now well-understood.[1] All depends on the constitutional powers, habits and environment as regards the integrity and nutrition of the cardiac muscular fibres. Remarkable cases of longevity are on record, even where the worst and most dangerous form of such disease is present — aortic reflux. Intelligent treatment, instigated by accurate physiological research, has much to do with securing long immunity from fatal issue in all the varied evolutions of these diseases. I have already referred to the danger of continued and other fevers, and of lobar pneumonia in such cases. Pregnancy may be well-borne in many instances of mitral disease, the worst of these, however, being

[1] *Vide* P. H. Pye-Smith, "Observations on the Prognosis and Treatment of Disease of the Heart," *Trans. Hunterian Soc.*, 1891.

examples of stenosis, a condition commoner by far in women than in men. Cases of mitral reflux and of stenosis may long remain free from symptoms. When failure sets in in the latter, life is seldom prolonged for many weeks.

In *Cardiac Dilatation* with myocardial degeneration, tumid liver, and dropsy, a commonly fatal sign is Cheyne-Stokes' respiration. This is also met with in arterio-sclerosis, uræmia, and cerebral apoplexy with greater frequency perhaps than in the last stage of cardiac disease. It is certainly one of the worst signs in any case, yet I have on many occasions known it to pass away, and some measure of recovery ensue. This is more particularly true of uræmic states.[1]

Rupture of the Heart is generally promptly fatal whether on the right side from injury, or on the left as a result of muscular degeneration. Life may, however, be maintained for some hours, or even days.

Tachycardia demands a very cautious prognosis. Sudden death may occur in a paroxysm. The outlook in Graves' disease is uncertain. One case in three may recover. Death may be sudden.

[1] My colleague, Dr. Ormerod, has known recovery to occur in a case of spinal sclerosis in which Cheyne-Stokes' respiration was present for some time.

Bradycardia is less grave as a symptom, unless it depends on uræmia or certain toxins, or occurs in association with cerebral hæmorrhage, tumour, bulbar disease, or disease of the cervical spinal medulla.

Prognosis in *Angina Pectoris* relates to the condition of the several structures of the heart and of the arterial system generally. When aortic reflux is present, the prognosis is most grave, and if advanced arterio-sclerosis exists, the same must be said. True angina is rare before the sixth climacteric. Pseudo-angina never kills.

Congenital Malformed Heart.—In the viable class of cases, life is rarely prolonged over puberty, the lesions being chiefly dextro-cardiac. These patients are liable to tuberculosis, and are bad subjects for specific infectious diseases. A better prognosis for longevity attaches to lesions of the aortic orifice which are, however, rarely encountered. Life may be prolonged to the third decade in these cases.

Ulcerative Endocarditis (arterial pyæmia), is almost always fatal, only subacute forms affording instances of recovery. The disease may last but a few days, or may persist for more than a year before proving fatal. The prognosis is particularly grave if infective organisms are detectible in the

blood of the patient, and can be cultivated from it.[1] (Kanthack).

Aortic Aneurysm.—No certain prognostics can be laid down in cases of this disease. Life is sometimes prolonged for ten or twelve years. Sacculated aneurysms of the ascending part of the thoracic arch, pressing forwards, are commonly very chronic, and cause least interference with vital structures, but they may, like other aneurysms, vary in the direction they take from time to time. In aneurysm of the abdominal aorta the prognosis is always grave.

Arcus Senilis is perhaps more generally recognised as a diagnostic than as a prognostic sign of a degenerated vascular system. By itself it is no sign of grave import. It may begin in the third decade of life, and death not occur for fifty or more years subsequently. Extreme arterial decay may be present and in progress without this indication.

Arterial Sclerosis and Atheroma.—Few pathological changes are apparently more capricious than arterial sclerosis and atheroma. With fairly soft radial and temporal arteries, there may co-

[1] Dr. Kanthack informs me that he has examined over twenty cases of septicæmia or endocarditis, and whenever organisms were found in the blood of the patients they died.

exist extreme atheroma of the aorta or of the cerebral arteries, little or altogether unsuspected, and *per contra*, hardened peripheral vessels may be no indication of similar conditions in the arteries of more essential and vital parts, such as the heart and brain. We may explain these seeming anomalies by reference to varying local conditions of blood-pressure, as shown by Oliver. These facts compel us to frame a not too confident prognosis in many cases of suspected widely diffused arterial decay. We have also to bear in mind the distinction between brittle and tough degenerate vessels.

DISEASES OF THE BLOOD AND DUCTLESS GLANDS.

Simple Anæmia in young women is apt to recur, but most cases will recover if vigorously treated at intervals for three years.

Pernicious Anæmia admits now of less grave prognosis than formerly, owing to treatment with arsenic and marrow. Relapses are common. Osler knows of no cases in males that remained well for five years. Examination of the blood may help us in prognosis. Kanthack considers that in all forms of anæmia a steady diminution of leucocytes is a bad sign, and no less grave is an increase

of the nucleated red corpuscles, with a progressive diminution of hæmoglobin.[1]

Leukæmia generally proves fatal within two or, at most, three years. The pure lymphatic form is the gravest. Hæmorrhagic tendency is of evil augury, and life is not of long duration after severe bleedings, internal or external. A gradual disappearance of the eosinophilous leucocytes is a bad sign in spleno-medullary leukæmia (Kanthack).

Hodgkin's Disease.—Most patients die within two years. Recovery is rare, but certainly occurs. The disease may last, with periods of quiescence, for four or five years.

Addison's Disease.—A fatal result is usual within two or three years, but life may be prolonged for six or eight years including periods of temporary improvement, exacerbation of urgent symptoms alternating with remissions of restored vital power.

DISEASES OF THE KIDNEYS.

Anuria of the obstructive variety, unless relieved by surgical measures, generally proves

[1] In recording examinations of the blood, it appears to be necessary to direct the attention of observers to the absolute importance of recognising the specific varieties of leucocytes as described by Ehrlich.

fatal within two weeks. Sometimes life is prolonged, with singularly few symptoms, for three weeks. In a case of Sir James Paget's, death did not occur till the twenty-second day.[1]

Albuminuria.—The prognosis in respect of this symptom is only to be framed by full consideration of all the features of each case. We have but little knowledge respecting the issue of cases of so-called cyclical albuminuria of young adults, chiefly male subjects, but may believe that many of such patients entirely recover. After the seventh climacteric, slight albuminuria with finely granular casts may occur for many years without giving rise to important symptoms.

Chyluria of the non-parasitic variety may last for many years without disturbance of health.

Chronic Nephritis, tubal, interstitial, or tubulo-interstitial, often runs a protracted course. Prognosis can be framed only by a consideration of all the personal and diathetic factors in each case. I have long been convinced that there is a great variation in the course and outcome of chronic parenchymatous nephritis; and while some patients rapidly pass into conditions beyond recovery, others hold on for many years, passing large quantities of albumin and degenerating tube-casts,

[1] *Clin. Soc. Trans.*, vol. ii. p. 170, 1869.

with little or no dropsy, no cardio-vascular changes, enjoying moreover very fair general health so long as care in all respects is taken. In one case known to me, a patient was given a year to live. This was over twenty years ago, but this gentleman is now in practically good health, although constantly passing albumin and casts. I am sure that many such patients do fairly well, and that by steady perseverance and treatment, remarkable improvements occur, improvements sometimes owing to no particular drug or dietary. I have certainly met with such cases, and have seen uræmic conditions arise again and again, with retinal hæmorrhages, retinitis, cardio-vascular changes, and severe dropsy, and yet a marked improvement has set in and surprised me. Thus, I think less gravely of uræmia than my preceptors were wont to do ; and by modern treatment with drugs, and occasionally by the older treatment of venæsection, I find this grave condition more amenable than was formerly the case. I have known attacks of uræmic convulsions, with Cheyne-Stokes' respiration, to pass away, together with other symptoms, after many months of apparent stasis and incoercible indifference to orthodox treatment. The personal factor and tissue-proclivities must therefore be reckoned with

in each case, and we have thus to regard the patient more steadfastly than his malady. It is in cases of this kind, and in subjects of diabetes, cancer, and chronic tuberculosis, that we have to bear in mind the fact that acute ailments supervening on chronic disease are amongst the most dangerous we are called upon to treat.

Uræmia in cases of interstitial nephritis is altogether a more grave condition, and in a chronic form without convulsions, but with more or less coma, and stertorous respiration, generally precedes a fatal event. Epistaxis, hæmoptysis, hæmaturia, or, indeed, any hæmorrhagic flux is to be reckoned salutary in cases of contracting granular kidney, as probably averting an intra-ocular or a fatal cerebral hæmorrhage.

Renal calculi may often be removed by medical treatment. Surgical interference is not always necessary.

DISEASES OF THE NERVOUS SYSTEM.

Neuritis.—Taking the whole group of conditions due to neuritis, a somewhat large and varied one, we may affirm that our prognosis is guided by consideration of the ætiology and personal factors in each case. Early recognition of the nature of the disorder and of the peccant matter which has

induced it is no less important than early treatment. The cases often last for months and years, but the results are quite remarkable if treatment be persisted in. I therefore regard the prognosis as generally favourable in cases of local neuritis (of which simple facial palsy is an example) and in cases of polyneuritis, whether febrile or toxic. Of the latter, saturnine neuritis is graver by far than arsenical.

Endemic Neuritis, or *beri beri*, if early treated, is not so serious a malady as is commonly supposed.

Primary Optic Neuritis is always a serious symptom.

Tobacco Amblyopia is, as a rule, recovered from.

Peripheral Facial Palsy without electrical changes, is usually recovered from within three weeks. With transposed electrical reactions, we may not look for recovery much under three months. With electrical reactions of degeneration, the outlook is tedious, and twelve to eighteen months may pass before recovery is complete. Traumatic facial palsy may be permanent.

Menière's Disease.—The prognosis is always uncertain. Recovery may occur, but deafness is the most frequent result. The symptoms may persist through life.

In *Torticollis* complete recovery is rare.

In *Essential Paralysis of Children* the outlook is certainly less grave now than formerly if assiduous electrical treatment be long carried out from the outset.

Pseudo-Hypertrophic Paralysis is invariably fatal.

In *Locomotor Ataxia* no absolute cure is to be expected, and the outlook is bad, though life may be prolonged for many years. Cases setting in violently are often devoid of the characteristic later symptoms, and an arrest of the disease may ensue. This is especially noted after the occurrence of early optic atrophy.

In *Aphasia* the prognosis is only hopeful in the young, who may sometimes be educated again in the right cerebral hemisphere.

Cerebral Apoplexy.—Prognosis in this condition chiefly relates to the particular locality involved, and the size of the blood-clot. Pontine hæmorrhage is uniformly fatal, generally within a few hours, and so is that into the ventricles. The gravest indications are deepening coma, rising temperature two days after the hæmorrhage, and Cheyne-Stokes' respiration. If the temperature falls after the third day and consciousness returns, a favourable issue may result. Albuminuria and glycosuria are of evil omen. A persistent firm pulse and the

occurrence of acute bedsore are also fatal symptoms. Sometimes the tenth or eleventh day may be reached after a cerebral hæmorrhage, but if the patient is restless and irritable a fatal result will follow, although the clot may not be large.

Chorea.—Cases of this disease admit of a generally favourable prognosis at any age below puberty. At that period, and after, the outlook is much more grave. Chorea insaniens is a very dangerous form. Rebellious insomnia is a fatal symptom. The average duration of the disease is ten weeks and three days. The prognosis even in severe cases is distinctly better now than formerly, since the introduction into practice of chloral hydrate.

In *Diseases of the Spinal Cord* the prognosis is commonly better in women than in men (Pye-Smith).

Epilepsy.—The truth of Hippocrates' aphorism respecting this malady is still attested: "Epilepsy supervening before puberty may undergo a change, those cases arising after the age of twenty-five for the most part terminate in death."[1] He also considered the prognosis to be bad in congenital epilepsy, and when it occurred in an adult without any previous cause. Death in a fit is rare, unless a large cerebral hæmorrhage occurs in

[1] *Aph.* 7, sect. vii.

the attack, or hæmophilia co-exists. The prognosis is better in the male sex. Most cases arising for the first time, in the third or fourth decade of life, with recurrence, are due to cerebral syphilis, and therefore admit of more favourable prognosis. Frequency of attacks and mental disturbance are always of grave import. Attacks of *petit mal* are to be regarded as serious, since they commonly eventuate in convulsive ones.

Status Epilepticus not infrequently leads to death by exhaustion.

We may fairly affirm that this serious malady, in most of its variations, is now amenable to treatment, dietetic and medicinal, in a degree that would have been cheering to Hippocrates and Galen, not to mention physicians of more recent date, who practised, it may be, up to five-and-twenty years ago.

Respecting *Insanity* in its several aspects, we may declare that the outlook is always serious when improvement fails to occur within twelve months from the first onset of symptoms.

DISEASES OF THE SKIN.

Acute Pemphigus may kill within ten days. Chronic forms may persist for many years.

Tinea of the scalp is not met with after puberty.

Favus is probably incurable.

Area is graver in the adult than in childhood, and when universal is very seldom recovered from. It is neither parasitic nor contagious.

Diffuse Sclerodermia is ultimately fatal.

Mycosis fungoides is incurable.

Eczema, when acute or chronic, is to be regarded favourably in the young. In the aged it is always a serious malady, and often proves fatal. In the latter cases there is commonly albuminuria, and often a gouty habit of body.

Physicians have long been wont to gauge the degree of vital and residual power in the sick by reference to the pulse, and in few departments of clinical work has more effectual knowledge been obtained than in this study, accurate physiological research having made plain, and placed on a scientific basis, the several conditions so long known to observant physicians, thus aiding materially no less in treatment than in prognosis. I do not, however, propose to discuss this subject further on the present occasion.

The conditions of the *Tongue* have only more recently attracted scientific attention in this direction, and for a careful study of these we are indebted, as physicians, to Dr. Dickinson, who, in his Lumleian Lectures of 1888, contributed most

ably to this subject.[1] To use his words, we may affirm that "the tongue, indeed, has a whole book of prognostics written upon its surface." The older physicians paid great attention to the condition of the tongue in diseases, and probably noted all that was observable to the eye. Modern study, however, places a different interpretation upon the nature and significance of many of the phenomena. Hippocrates was not behind in such observation, as might be expected. We are here and now chiefly concerned with such conditions as enable us to form a favourable or unfavourable prognosis, and of these we have to take note more particularly of the dry tongue. This has always been regarded as grave. Dickinson found that patients, examined without selection, who had dry tongues, of whatever origin, exhibited a mortality of 50 per cent.[2] This indication mainly relates to prostration. "The kinds of diseases which it accompanies are chronic more than acute; if febrile, usually continued." Pyrexia and deficient secretion from the salivary and the buccal glands are the chief factors. "The tongue is found dry, glazed and smooth in the later stages of tuberculosis, and in exhaustion from continued suppura-

[1] *The Tongue as an indication in Disease.* Longmans, 1888.

[2] *Op. cit.*

tion; dry and rough at the end of cases of cerebral disease, hepatic cirrhosis, cancer, pyæmia, and severe pneumonia." Amongst the conditions of the tongue which favour a satisfactory prognosis in any case, are to be noted recovery of moisture, and a cleaning of fur from the tip and edges towards the dorsum.

It might be expected that in treating of prognostics, I should allude to the doctrine of crises and critical days. We have heard little respecting these in our time—little, certainly, that is dogmatic. But I venture to think that the best modern clinical research has done nothing to discredit the greater part of the doctrines of Hippocrates, Galen, and their followers in this respect. The accurate study of acute inflammation, of pneumonia, of the varieties of acute pleurisy, of the continued fevers, the exathemata, and acute catarrhal processes, has much confirmed the old doctrines, and illustrated the true nature of crises and the causes on which they depend. Were we to take the pains, I believe we might go further, and find the grounds for the old belief in "indicatory" and "judicatory" days, and for dependence on the "septenaries."[1]

[1] The 7th, 14th, and 20th days were considered the most important of these.

As Dr. Munk has pointed out, it may be that we now, by medicinal interference, prevent the occurrence of various symptoms in acute disease, which, in former days, were allowed to manifest themselves as crises and præ-crises. Let us hope, if this be so, that we are at least doing no harm to our patients. This is not, perhaps, a barren fear. To take the case of pyrexia, may it not be that we do ill by seeking to suppress what is probably a very salutary process, and a way out of the disease, by administering in a routine fashion, and often inordinately, antipyretic drugs?

Some remarks of Dr. Munk's in the oration I have referred to so well apply at the present day, that I venture to quote them here, expressing at the same time my entire agreement with them, and my regret that they should still be applicable in the expiring years of this century. "In the unhealthy state of the public mind in all subjects relating to medicine which characterise the present times (1858), where scepticism of all that is scientific, unostentatious, and orthodox in physic is associated with an astounding credulity towards anything absurd, unintelligible, presumptuous, and heterodox, there is nothing so well calculated to take and hold possession of the public mind, nothing which would more certainly conciliate the

good opinion and confidence of the public towards legitimate medicine and its professors than that minute, systematic, and accurate prognosis which was practised by our forefathers."

It would be interesting to study the question of prognostics in diseases affecting different races of men. What little knowledge we have of the subject indicates that there is a variation in vulnerability between the fair- and the dark-skinned races. The vital resistance and invulnerability of the Hebrew race is, to my mind, very noteworthy. So much so is this the case, that I am wont to frame a better prognosis generally for Jewish patients under all circumstances.

We, as bedside physicians, exist to small purpose in the body-politic, and our art, as exercised upon the ailments and sufferings of humanity, is of no avail if it be not in the highest and best sense practical. We are now in peril already, as I have said, from too narrow and limited conceptions of diseases by reason of the inevitable differentiation and the specialism which is so rife amongst us; and these modern phases require to be chastened by a review of all medicine from a higher and more comprehensive standpoint. The most experienced practitioners will agree with me when I

say that it is not always an easy matter to certify how long a patient has to live, even in the presence of well-recognised symptoms of impending death. The end comes sometimes more rapidly and suddenly than was anticipated. Again, life is sometimes protracted in a remarkable manner, and our forecasts are proved to be fallacious. There is, however, no mistaking the speedy fatal issue in any case when the condition known as "the agony" once sets in, with the *facies Hippocratica*, and tracheal râles,[1] the sensorium being dull, the nose and extremities becoming cold, and cold sweats bathe the body.

In pulmonary phthisis and cancer of the stomach we meet with the most protracted fatal issues. In poisoning by strychnine and in rapidly spreading peritonitis, as after rupture of gastric ulcer, the unwary may be misled as to the certain fatal issue (unless modern surgery is promptly invoked in the latter case) by the perfect mental clearness of the patients up to the last moments.

Relatives and friends of the sick often ask our opinion and demand a prognosis, and they look to us to give them dependable information in the most decided and dogmatic form. No part of our

[1] ῥέγχος.

duty demands more skill and tact than to afford a proper reply to these questions. While we must always be as hopeful and encouraging as is permissible, we must not shirk the unpleasant truth which has so often to be declared. An old and wise physician, Dr. George Fordyce, was wont to guard and express himself, under these circumstances, by the use of a cautious "if." *If* this or that should not occur, he said, we may hope for improvement, but *if* such and such a symptom supervened, we might not look on hopefully any longer.[1] I commend the use of this cautious "if"; but while it is very damaging to our character to be an alarmist, or to prognosticate evil things which never happen, it is more serious by far, to be an optimist, and to prove that we have not adequately gauged the true measure of gravity in any case we have to do with. The physician who brings most healing power to the bedside with him is generally one who is bright and encouraging, and inspired always with good hope.

The most accurate prognosis comes from him who has with care, and a large chastened experience, first established a correct diagnosis, and has also learned to employ remedial measures with

[1] Dr. Fordyce was physician to St. Thomas' Hospital, 1770.

judgment and good sense. An eminent French physician once said: "No one can frame a prognosis for a diabetic patient until he has been fifteen years in practice." If this be true, as I venture to think it is, we may apply the somewhat trite assertion to many other morbid states than that of which glycosuria is a symptom; and the significance of the whole matter is this, that we must look to the seniors of our profession to aid us in the matter of prescience or skilled prognosis. The younger men may often afford light in the matter of modern diagnostic methods to their seniors, but the experience and knowledge of the latter is needed, not seldom, in forecasting the issue of a case. Of these, the most shrewd may be perhaps the least confident, remembering that no *præsagia mortis* are invariably to be relied upon.[1]

I will close this address in words of Hippocrates which commend to us all the study of prognosis. "It appears to me a most excellent thing for the physician to cultivate prognosis; for by foreseeing

[1] "There can be no doubt that, in the present state of medical science, he who combines a simple and accurate observation of individual circumstances with an enlightened, but cautious, use of pathology, will be found the most sagacious in prognosis as well as the most successful in practice."—*Cyclop. Pract. Med.*, Art. *Prognosis* (*jam cit.*), 1834.

and foretelling in the presence of the sick, the present, the past, and the future, and explaining the omissions which patients may have been guilty of, he will be the more readily believed to be acquainted with the circumstances of the sick, so that men will have confidence to entrust themselves to such a physician. And he will manage the case best who has foreseen what is to happen from the present state of matters."[1]

[1] *προρρητικόν ά.*

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* *Vide* case recorded by C. E. Harrison, M.B., Grenadier Guards, in which sloughing of a portion of the testicle occurred: *Lancet*, June 9, 1893.

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